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AD-A218 526

FINAL
SETA Contract Number
F11624-88-D-0002
Delivery Order 6K04
CDRL A004

Technical Report - Study/Services
Site Preparation Guide
1 March 1990

Cargo Movement Operations System (CMOS)

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FEB 28 1990
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DISTRIBUTION STATEMENT A

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Prepared For

Standard Systems Center/AQFT
Gunter Air Force Base, Alabama 36114-6343

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ETAMGM-90-043 (ETA CMOS 0051)

Department of the Air Force
Standard Systems Center/AQFT
Gunter AFB, Alabama 36114

20 February 1990

Attention: Maj Terranova

Subject: CDRL A004, Technical Report - Study/Services
Site Preparation Guide - Revised

Reference: a. Contract F11624-88-D-0002, D.O. 6K04
b. DID DI-MISC-80508

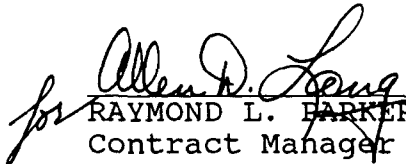
Dear Maj Terranova,

In accordance with the requirements of referenced contract ETA Technologies submits, herewith, three copies, of the final version Site Preparation Guide. All changes noted in the SSC/AQAC letter dated 29 Dec 89 have been made as indicated in Attachment 1.

Additional distribution of this document has been made as noted.

Respectfully yours,

ETA TECHNOLOGIES CORPORATION


RAYMOND L. PARKER
Contract Manager

2 Atch:
1 CMOS CDRL Items
2 Site Preparation Guide

cc: SSC/AQAC (1)
SSC/PKAB (Ms. Thompson, Ltr Only)
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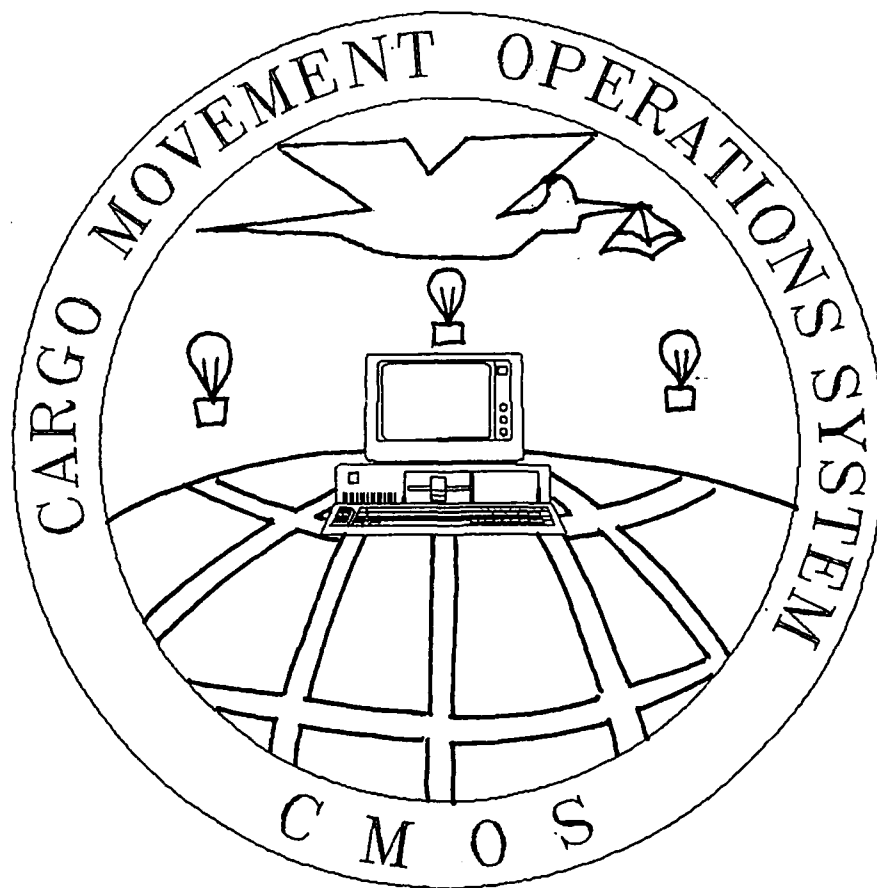
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SITE PREPARATION GUIDE

INCREMENT I & INCREMENT II

CARGO MOVEMENT OPERATIONS SYSTEM (CMOS)



1 March 1990
OPR: SSC/AQFT

SITE PREPARATION GUIDE

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Chapter 1

THE SITE PREPARATION GUIDE

1. **Purpose.** The purpose of this guide is to provide information to assist MAJCOM/Base personnel involved in conducting site surveys, preparing Program Support Agreements (PSA), and determining facility preparation requirements for the Cargo Movement Operations System (CMOS). The guide also familiarizes site survey and facility preparation personnel with CMOS. Additionally, it identifies the activities and responsibilities associated with providing adequate facilities and a local area network (LAN) for the CMOS program. (S. 0. 0. 4)

2. **Objectives.** The objectives of this guide are:

- a. Acquaint the MAJCOMs and bases with CMOS.
- b. Provide the MAJCOMs and bases a description of their responsibilities in planning, programming, budgeting, designing, and modifying facilities required to accommodate the CMOS equipment.
- c. Provide a logical sequence of events to ensure facility and telecommunications surveys are conducted, and needed support is available for implementation of the CMOS equipment.
- d. Provide sufficient technical data to MAJCOM and base Transportation, Civil Engineering, and Communications personnel to analyze and design the required facility support package.
- e. Provide sufficient system equipment and configuration data to allow the MAJCOMs to conduct the facility site surveys.

3. **Assumptions.**

- a. The term "facility" is defined to be an all-encompassing word and is not limited to just the equipment area. The term also includes the operational support space, utility systems for all areas, and all other special considerations required of a CMOS facility (communications, physical security, fire protection, etc.).
- b. Each site will program an Operations and Maintenance (O & M) project or appropriate work orders to support the CMOS equipment installation.
- c. The installation of the early-on sites will have adequate base-level support even when the program does not meet the Base Civil Engineering (BCE) and Communication unit's normal programming or planning lead times.

d. Limited funds will be available for equipment, installation, and facility upgrades.

e. All computer hardware and materials can be delivered and installed by stated installation dates.

4. Responsibilities. This section outlines responsibilities applicable to site preparation for the CMOS program.

a. HQ AFCC will:

(1) Serve as the implementing command and be responsible to HQ USAF/LE for overall program management of the CMOS program implementation.

(2) Coordinate with the CMOS Program Office, the MAJCOMs and Comm Divisions to:

(a) Ensure communications requirements to support CMOS are properly identified.

(b) Provide communications support in time to support system implementation.

b. All participating commands will: (AAC, AFCC, AFALC, AFLC, AFRES, AFSC, AFOTEC, ATC, AFSPACECOM, AU, PACAF, TAC, SAC, USAFE, ANG, MAC, ESC)

(1) Support the implementation of the CMOS program with personnel and materiel resources for site preparation. Limited site preparation funds will be provided through the Program Office (SSC/AQFT).

(2) Provide command site survey orientation support for all CMOS sites within their commands through regional training conferences. (Should consist of representatives from LGT and XP.)

(3) Ensure necessary documentation is prepared to support programming, budgeting, and reporting. (See annex B)

(4) Provide SSC/AQFT detailed cost estimates for each site preparation for review/validation.

c. The Program Management Office (PMO), SSC/AQFT, will:

(1) Provide MAJCOM orientation on the CMOS program and conduct site survey training at the MAJCOM base (see Annex A).

(2) Coordinate with the participating commands to ensure facility and telecommunications surveys are conducted and adequate facilities and telecommunications support are available.

(3) Provide detailed guidance so MAJCOM personnel can conduct operational site surveys.

(4) Track site support effort at each installation through monthly reports submitted by the Comm/XP office.

(5) Provide a POC for MAJCOM questions.

d. SSC/AQAE (Civil Engineering Division of SSC) will:

(1) Provide a Civil Engineering point of contact for all MAJCOM and base CE functions.

(2) Validate the required work and cost for each installation prior to funds transfer.

(3) Provide site visits to assist MAJCOMs if facility problems cannot be resolved.

e. Bases will:

(1) Perform site surveys under MAJCOM guidance.

(a) Appoint a CMOS manager from the LGT office.

(b) Appoint functional POCs in Comm and CE to handle CMOS requirements.

(c) Survey the site using guidance in this document with DE, XP, LGX, and LGT personnel.

(d) Submit Civil Engineering construction requests through Civil Engineering and communication channels (Annex B).

(e) Submit communications requirements through Comm XP for processing through the Communications - Computer Systems Requirements Board (CSRB) (Annex C).

(2) Complete the Program Support Agreement (Annex D).

(3) Provide monthly status reports (Figure 4-2).

(4) Provide updated site survey information, as necessary, to the CMOS program office.

NOTE: The XP office will act as the primary focal point for accomplishing site surveys, processing communication/construction requirements, and providing monthly status reports. The transportation representative will be the overall base-level manager of the CMOS program. This person will coordinate with other agencies and provide transportation expertise and insight relative to CMOS objectives.

Chapter 2

THE CARGO MOVEMENT OPERATIONS SYSTEM

1. **General.** The Cargo Movement Operations System (CMOS) provides worldwide automated logistics support to base-level transportation activities.

2. **CMOS System.** CMOS automates the receipt, processing, and movement of material within the National Defense Transportation System. CMOS allows transporters to effectively plan and schedule shipments into the transportation pipeline by processing and passing this information in an accurate and timely manner. The system also controls shipment units to maximize the use of transportation resources and reduce transportation costs. Shipment consolidation and mode of shipment are determined by Air Force mission requirements, priority, nature of material, weight, cube, and other cost alternatives. Additionally, by using resident files, interfaces with other automated systems and manual input source data, the system will automate shipment consolidations, hazardous material processing, and packing requirements.

3. **CMOS Increments.** CMOS will be developed in three increments.

a. Increment I is the first step in the development of the CMOS program. It will provide standard automated procedures for the capture, transfer, and control of cargo movement information. Increment I will provide transporters a responsive automated system which will handle day-to-day base-level transportation. It will improve shipment/resupply visibility and electronic interface with the USAF Standard Base Supply System on shipment status and intransit data. It will also send automated shipment data to transshipment points and consignees and generate management and workload report data.

b. Increment II, Transportation Mobility Deployment (TRANSMOD), will provide the Air Force version of the Joint Chiefs of Staff (JCS) Transportation Coordinators Automated Information for Movements System (TCAIMS). This increment will establish a direct interface with the Contingency Operations/Mobility Planning and Execution System (COMPES). Information available within the CMOS, coupled with the interface with COMPES, establishes a foundation for a totally automated cargo movement operations system. This increment will support mobility exercises, contingencies, and crisis deployments, as well as normal day-to-day requirements. Movement data will be provided to MAJCOM COMPES, Military Airlift Command (MAC), and other CMOS systems for use during crisis periods. This increment will also provide automated mobility functions and radio frequency transmission of cargo data for mobility.

c. Increment III - Preplanned Product Improvement (P³I). This increment will automate the remaining labor-intensive requirements not automated in Increments I and II. This increment consists of requirements not currently defined to a sufficient level of detail for development. These P³I requirements will be added after CMOS system deployment. Initial P³I estimates are 25 menu screens, 100 user input screens, and 15 system reports.

4. Functions To Be Automated.

The cargo movement functions in Increment I consist of four primary workcenter modules on which the rest of the CMOS system will be built. The four workcenters to be automated and their individual functions are listed in Table 2-1. Table 2-2 provides a list of mobility functions which will be automated under Increment II.

Table 2-1 FUNCTIONS TO BE AUTOMATED - INCREMENT I

Packing and Crating:

- In-check from Base Supply using Bar Code Scanner.
- Print Bar Coded Shipping Labels.
- Maintain/Print Organizational Reusable Container Report.
- Provide monthly T-WRAPS data.

Shipment Planning:

- Receive 1348-1 Document Record via electronic interface with Base Supply.
- Maintain Non-MILSTRIP TCN Register.
- Identify documents/shipments for consolidation.
- Prepare/send Advance TCMD/trailers.

Surface Freight:

- In-check using Bar Code Scanner.
- Process intransit data (IDC).
- Maintain Tonnage Distribution Record.
- Prepare/print Government Bills of Lading.
- Prepare/print Commercial Bills of Lading.
- Prepare/print Government Truck Manifest.
- Maintain Bill of Lading Registers.
- Maintain Obligation Authority Records.
- Provide monthly T-WRAPS data.

Air Freight:

- In-check using Bar Code Scanner.
- Process intransit data (IDC).
- Maintain Over/Short Shipment Records.
- Provide Backlog Listing by warehouse location, destination POD, DODAAC, or priority.
- Build pallets using Bar Code Scanner.
- Print pallet inventory list.
- Prepare/print Final Air Manifest.
- Maintain Air Manifest Register.
- Prepare LOGAIR history and reimbursement report.
- Prepare Monthly Station Traffic Summary.
- Provide monthly T-WRAPS data.

Table 2-2 FUNCTIONS TO BE AUTOMATED - INCREMENT II

Transportation Mobility Development (TRANSMOD). This increment provides deployment supportability by automating the following:

- Build on CMOS Increment I.
- Automate Base Level Mobility Functions:
 - Mobility Control Center (MCC).
 - Transportation Control Center (TCC).
 - Air Cargo Terminal (ACT).
 - Air Passenger Terminal (APT).
 - Sub Motor Pool (SMP).
- Interface with Contingency Operations/Mobility Planning and Execution System (COMPES).
 - Receive Mobility Schedule of Events (MSOE) and detailed Cargo/Pax record from COMPES.
 - Update MSOE as scheduled actions occur.
- Produce automated load plans of aircraft, trucks, and railcars using Computer Aided Load Manifesting System (CALM).
- Alert Transportation Control Unit of problems with schedules.
- Pass movement data to MAJCOMs, Transportation components of US TRANSCOM, Base level systems, and other CMOS sites
 - Interface with Base Level Combat Ammunition System (CAS-B).
- Interface with Military Traffic Management Command (MTMC).
 - Domestic routing request.
 - Export Traffic Release request.
- Establish electronic data interchange.
 - Interface with private sector and DOD agencies to pass and receive bills of lading.
- Computer generate hazardous cargo documentation.
- Track personnel and training records for mobility positions.

Chapter 3

SITE SURVEY REQUIREMENTS

1. General. This chapter describes the composition of the site survey team, procedures for conducting a site survey, and site survey requirements.

2. Site Survey Team. The site survey team will include but is not limited to the following representatives:

- a. Program Management Office Representatives.
(OT&E and Lead Bases Only)
- b. MAJCOM CMOS Representatives.
(As desired by MAJCOM)
- c. Base LGT CMOS Manager.
- d. Base Comm XP Representative: Communications and Program Support Agreement (PSA) expertise is needed from the Comm representative.
- e. Base DE Representatives.
- f. Base LGX (Mobility) Representative.

3. Site Survey Team Objectives. The survey team will follow the guidance in this document to:

- a. Determine equipment location and configuration for Increments I and II.
- b. Determine communication support requirements.
- c. Determine Civil Engineering support requirements.
- d. Provide data for LAN support.
- e. Prepare an equipment requirement list.

4. LAN Support. LAN support for this program is dependent on the equipment locations and where workcenters are collocated. Ensure that the intended method of communication from each workcenter to the central computer is determined so Comm and CE support is properly identified (refer to Annex C guidelines).

5. Site Survey Tasks. The following tasks must be accomplished to ensure that the site is prepared for the CMOS equipment. The time phasing of the tasks can be found in Tables 3-1 and 3-2.

- a. LGTT/Comm XP brief site survey team personnel.
- b. Complete Site Survey Checklists. (Tables 3-3 through 3-6)
- c. Determine workcenter/location requirements: (Chapter 5)
 - (1) Consolidate workcenters by building and room.
 - (2) Explain, if major workcenters are not included in survey. (Example: Air Freight does not exist at your base.)
 - (3) Evaluate effects of future plans on current facilities. (Example: new office or building construction.)
- d. Determine workcenter equipment requirements (microcomputers, printers, modems, etc.) (See Tables 5-1 and 5-2.)
- e. Determine possible Comm/LAN connection of workcenters to central computer. (Annex C)
- f. Visit the central computer area and each workcenter and evaluate need for:
 - (1) Electrical power. (Chapter 5, Sect III)
 - (2) Air conditioning. (Chapter 5, Sect III)
 - (3) Dedicated 4-Wire telephone lines. (Dial-up lines may be a suitable substitute in cases where alternate/contingency work locations may exist or dedicated lines are not available.)
 - (4) Work space for each computer system. Include printers, modems and other hardware needed to support the workcenter. (See Chapter 5, Sect II.)
- g. Review the Comm/LAN interconnections and determine the method to be used by the workcenter. (Annex C)
- h. Determine CE support. (Annex B)
- i. Complete PSA. (Annex E)

6. CMOS Site Survey Checklists.

a. The checklists provided in Tables 3-3 through 3-6 are intended to help the site survey team ensure they have covered all support requirements. The questions are intended to aid in the necessary decision process but will not fit all situations since each installation is site specific. References are not necessarily complete and are not intended to replace this guide.

b. Abbreviations used in the checklist and sections to be surveyed are:

AF = Air Freight
SF = Surface Freight
SP = Shipment Planning
PC = Packing & Crating
ACA = Air Clearance Authority
MCC = Mobility Control Center
TCU = Transportation Control Center
ACT = Air Cargo Terminal
APT = Air Passenger Terminal
SMP = Sub Motor Pool
LP = Load Planning
LRC = MAJCOM Logistics Readiness Center
CAS = Combat Ammunition System
LGTX = Transportation Plans & Programs Office

7. Do's & Don'ts.

a. Don't delay the Site Survey and PSA due to lack of available Comm lines.

b. Do ensure that adequate power receptacles and environmental conditions are available.

c. Don't consider or plan base-wide networks at this time. CMOS will not interface with the base-level LANs at this time.

d. Don't plan system hardware to be located beneath air conditioners/coolers or next to heat ventilators/radiators.

Table 3-1 **CMOS FACILITY PREPARATION ACTIVITIES (CONUS)**

<u>ACTION</u>	<u>OPR</u>	<u>OCR</u>	<u>START MONTH</u>
Survey (INC. I & II)	MAJCOM	SSC/AQFT	- 18
Base Concurrence	Base Commander	MAJCOM	- 17
Initiate CE and Comm Work	XP	LGT	- 17
BCE Work Complete	BCE	XP/LGT	- 2
Base Comm Work Complete	Base Comm	LGT	- 1
Preinstallation Survey	MAJCOM	SSC/AQFT	- 1
CMOS Equipment Installation	SSC/AQFT	MAJCOM	0
Operational Test Date (Inc I)	Transportation	SSC/AQFT	+ 0
Required Operational Date (Inc I)	Transportation	SSC/AQFT	+ 1

Table 3-2 **CMOS FACILITY PREPARATION SCHEDULE (OVERSEAS)**

<u>ACTION</u>	<u>OPR</u>	<u>OCR</u>	<u>START MONTH</u>
Survey (INC. I & II)	MAJCOM	SSC/AQFT	- 24
Base Concurrence	Base Commander	MAJCOM	- 23
Initiate CE and Comm Work	XP	LGT	- 23
BCE Work Complete	BCE	XP/LGT	- 2
Base Comm Work Complete	Base Comm	LGT	- 1
Preinstallation Survey	MAJCOM	SSC/AQFT	- 1
CMOS Equipment Installation	SSC/AQFT	MAJCOM	0
Operational Test Date (Inc I)	Transportation	SSC/AQFT	+ 0
Required Operational Date (Inc I)	Transportation	SSC/AQFT	+ 1

Table 3-3 CMOS SITE SURVEY CHECKLIST - GENERAL QUESTIONS	
1. Were the workcenters listed in Tables 5-1 and 5-2 reviewed to identify local requirements, consolidation of workcenters or workcenters not used at your base?	
2. Were the locations, by building and room number, identified for the Central Computer Area and workcenters?	
3. Were future plans considered that could affect this program?	
4. Was the equipment list (Tables 5-1 and 5-2) reviewed to determine requirements for your base by workcenter?	
5. Were facility support requirements considered for each piece of equipment?	
6. Was an overall COMM/LAN plan developed to ensure all workcenter locations are covered, local and remote?	
7. Were the requirements in Chapter 5 and Annexes B and C considered to ensure resources are available for implementation?	
8. Was an equipment requirement verification list prepared for the PSA?	

Table 3-4 CMOS SITE SURVEY CHECKLIST - CENTRAL COMPUTER AREA	
1. Is adequate space available for equipment layout?	
2. Will the area meet the facility requirements in Annex B?	
3. Were the power requirements in Annex B, Table B-1 met?	
4. Were the air conditioning requirements in Annex B, Table B-1 met?	
5. Were the structural, fire, and security requirements in Annex B considered?	
6. Are sufficient comm lines available per Annex C?	
7. If 6 is "no," have the cabling requirements been identified, both local and remote?	
8. Has the RF antenna placement been considered?	

Table 3-5 CMOS SITE SURVEY CHECKLIST - INCREMENT I					
Increment I Workcenters:	AF	SF	SP	PC	ACA
1. Was the collocation of workcenters considered?					
2. Are sufficient power receptacles available to support equipment, new and existing?					
3. Is power quality adequate?					
4. Have all equipment support requirements in Annex B been considered?					
5. Have the Comm requirements in Annex C for cable support been considered?					

Table 3-6 CMOS SITE SURVEY CHECKLIST - INCREMENT II									
Increment II Workcenters:	MCC	TCU	ACT	APT	SMP	LP	LRC	CAS	LGTX
1. Was the collocation of workcenters considered?							n/a	n/a	n/a
2. Are sufficient power receptacles available to support equipment, new and existing?									
3. Is power quality adequate?									
4. Have all equipment support requirements in Annex B been considered?									
5. Have the Comm requirements in Annex C for cable support been considered?									n/a

Chapter 4

PSA REQUIREMENTS:

1. General. This chapter describes the requirements for developing and coordinating the Program Support Agreement (PSA).

2. Program Support Agreement. The Comm XP office, in coordination with the LGTT representative, will initiate a Program Support Agreement (PSA) and other local documentation required to initiate work. Annex D contains a generic PSA and instructions for completion. The PSA should be coordinated with base support agencies to indicate concurrence with the proposed facility usage, modification, and required completion date to support the CMOS program. The PSA should be signed by the Communications - Computer Systems Requirements (CSRB) Chairman. The Staff Summary Sheet should be signed by either the Wing Commander or Base Commander, as applicable for the base. The following persons should coordinate on the PSA or Staff Summary Sheet:

- a. Base Civil Engineer Commander.
- b. Base Communications Squadron Commander.
- c. Base Transportation Squadron Commander.
- d. CSRB Chairman.

3. Documentation, Validation, and Tracking.

a. Prior to submitting the PSA, the Comm XP POC, in coordination with the CMOS Manager, should complete the Program Support Agreement (PSA) Checklist (Figure 4.1) to ensure that the PSA has been properly prepared and that all required documentation is attached.

b. Two complete copies of the PSA will be sent to SSC/AQFT, Bldg 856, Gunter AFB AL 36114-6343. Two copies of the PSA will also be sent to the MAJCOM/LGTT. PSA approval is subject to SSC/AQFT review. Note: The XP/CMOS Manager must ensure that all copies are clear and legible since critical engineering processes are dependent upon the legibility of the copies.

c. Comm XP will provide monthly status reports in accordance with Figure 4.2.

d. Documents and validations required for funding construction and telecommunication requirements will be handled IAW Annex B and C.

e. Comm XP will provide validation of completed site

preparation so equipment installation can be scheduled. Power needs to be in place three months prior to installation.

4. Program Support Agreement Checklist. Figure 4.1 provides a helpful checklist to be used when preparing the PSA. It covers most of the essential elements of the PSA needed to accomplish desktop engineering of the CMOS LAN. Please use the checklist to ensure that all of the necessary information is contained in the PSA.

5. Monthly Status Report. Figure 4.2 provides an example of the monthly status report format. Items listed are essential to maintaining the CMOS database and monitoring program actions. Your assistance in providing this report on a monthly basis will help the PMO properly manage the program.

6. Timing. The PSA should be completed and forwarded to SSC/AQFT NLT 30 days following MAJCOM site survey training or the survey completion date shown in Annex A, whichever is sooner.

7. Do's & Don'ts.

a. Don't delay the Site Survey and PSA due to lack of available Comm lines.

b. Don't delay processing PSA. If problems exist, XP should notify the PMO regarding status and expected completion dates.

c. Do process Increment I requirements separately from Increment II.

d. Don't let Increment II problems interfere with processing Increment I requirements.

e. Don't hold up completing PSA until regularly scheduled CSRB. If necessary, walk the PSA requirements through out of cycle.

PROGRAM SUPPORT AGREEMENT (PSA) CHECKLIST

Please ensure that your PSA contains all of the following information:

Cover Letter:

- ☐ Program support letter signed by the Wing or Base Commander.
- ☐ Staff Summary Sheet showing full coordination of the PSA.

PSA Attachment 1, Part 1: (Site Survey Representatives)

- ☐ List of persons involved in conducting the site survey.
- ☐ List of POCs and personnel familiar with the various attachments in the PSA, associated requirements, and work sites.

PSA Attachment 1, Part 2: (Equipment Requirements and Locations)

- ☐ Base implementation data listing: building locations, building numbers, and equipment requirements.
- ☐ Indicate exact number and type of equipment needed following guidelines in Site Preparation Guide.

PSA Attachment 2: (Base Civil Engineering Support)

Projects costing less than \$2,000:

- ☐ 2 copies of completed AF Form 332 and/or AF Form 327 for any civil engineering support required.

Projects costing between \$2,000 and \$15,000:

- ☐ 2 copies of a front page AF Form 1391 and appropriate planning documentation for validation of project.

Air Conditioning:

- ☐ Statement indicating whether air conditioning is/is not needed. If needed, include 2 copies of AF Fm 332 requesting installation.

Fire Protection:

- ☐ Statement indicating availability of suitable Halon fire extinguisher (max 70 foot distance from computers.)

Figure 4.1
Program Support Agreement (PSA) Checklist

Power Requirements:

- ☐ Statement indicating any unusual power fluctuations, dirty power, or requirements for power conditioning, if required.
- ☐ 2 copies of AF Fm 332 requesting installation of dedicated circuit/circuit panel for the UPS when required.

PSA Attachment 3: (Base Communications Support)

Communications Systems Requirements Document (CSRD):

- ☐ 2 copies of approved AF Form 3215 to install any additional dedicated or dial-up cable pairs needed for this program.
- ☐ If approved CSRDs cannot be obtained by suspense date for return of the PSA, provide copy of form submitted and date when approval will be available.

Cable Support:

- ☐ Availability of one dedicated telephone line:
 - ☐ Between the host and each remote workstation.
 - ☐ To the DDN Concentrator.
 - ☐ To the MAJCOM/NAF Logistics Readiness Center (LRC). (MAJCOM/NAF host bases only)
 - ☐ To the base munitions office that handles the Combat Ammunition System (CAS).
- ☐ If cable pairs are not available, include date when base will complete installation of required cable to the demarkation point. This installation will be base funded.
- ☐ If base communications cannot support requirement, include copy of message sent to SSC/AQFT detailing problems.

PSA Attachment 4: (Drawing List with Drawings)

- ☐ Set of Civil Engineering "as built" drawings for each work site.
- ☐ Drawing of each building:

Figure 4.1 (Cont)
Program Support Agreement (PSA) Checklist

Architecture: (LGTT/Comm/DE)

- ☐ Show room dimensions and ceiling height for each office.
- ☐ Show overall building dimensions.
- ☐ Indicate ceiling types, heights, and crawl space.
- ☐ Show type of wall for all interior and exterior walls.

Telephone/Cable: (Comm/XP)

- ☐ Locate and mark the demarkation point for telephone wires.
- ☐ Color code existing and new required telephone demarkation points.

Electrical: (DE)

- ☐ Locate and mark electrical panels.
- ☐ Color code existing and new required electrical panels.

New Construction: (LGTT/DE)

- ☐ Color code any new office construction required to support CMOS or other activities and provide dimensions.
 - ☐ Drawing of each office or group of offices.
 - ☐ Show location of current and planned wall electrical plugs (color code).
 - ☐ Show location of current and planned telephone jacks (color code).
 - ☐ Show desired location of future CMOS hardware.
 - ☐ For the above items, show distances from walls, height from floor or ceiling, etc.
- ☐ Forward Original and one copy of PSA and attachments to SSC/AQFT, Bldg 856, Gunter AFB, Alabama 36114-6343.

Figure 4.1 (Cont)
Program Support Agreement (PSA) Checklist

MONTHLY STATUS REPORT FORMAT

FROM: **BASE** //Comm/XP//

TO: **MAJCOM** //LGTT/SCX/DEP//

INFO: HQ USAF WASH DC //LETX/LETT//
SSC GUNTER AFB AL //AQFT/AQAE//
HQ AFCC SCOTT AFB IL //LGTT/DEPR/AIAS//
(OTHER INFO ADDRESSES AS REQUIRED)

ZEN**BASE** //DEE/LGX/LGTX//

SUBJECT: CMOS STATUS REPORT, **MONTH, YEAR**

1. SITE SURVEY SCHEDULED DATE:
2. SITE SURVEY COMPLETION DATE:
3. PSA COMPLETION DATE:
4. DATE PSA SENT TO MAJCOM AND SSC/AQFT:
5. DD FORM 1391 APPROVAL:
6. DESIGN STATUS:
7. PROJECT VALIDATION/FUNDS TRANSFER INITIATED:
8. PROJECT VALIDATION/FUNDS TRANSFER COMPLETE:
9. SCHEDULED CONSTRUCTION START DATE:
10. ACTUAL CONSTRUCTION START DATE:
11. CONSTRUCTION STATUS:
12. SCHEDULED CONSTRUCTION COMPLETION DATE:
13. ACTUAL CONSTRUCTION COMPLETION DATE:
14. COMM WORK STATUS:
15. FACILITY PREP COMPLETION DATE:
16. DDN SERVICE REQUEST DATE:
17. EQUIP DELIVERY STATUS:
18. EQUIP DELIVERY COMPLETION DATE:
19. REMARKS: (Include any remarks which will help explain problems or status of the CMOS project. Include names of POCs if changed since last report.)

Figure 4.2
Monthly Status Report

Chapter 5

SYSTEM HARDWARE AND ARCHITECTURE

SECTION I - GENERAL REQUIREMENTS

1. General. The following information describes the hardware and architecture used to develop the CMOS system. Information provided is the latest available and subject to change. The tables in this chapter should be utilized by the survey team when determining their overall electrical, communication, and hardware requirements.

2. Terms.

a. **Computer System:** Generally referred to as the microcomputer box, video monitor, and printer. This may also include a modem and spiker box.

b. **Host Computer:** A minicomputer used to manage a multiuser or LAN system, hold the operating system files, and provide storage facilities for user-generated files.

c. **MAU (Medium Attachment Unit):** An interface unit. (The CMOS MAU will function as a LAN Terminal Server and provide the access ports for telecommunications with remote functional areas.)

d. **Non-collocated Workstations:** These workstations are those connected to the main CMOS LAN through dedicated or dial-up telephone lines (see Annex C). A non-collocated workstation is defined as one which is located in a separate building from the CMOS LAN or, due to other physical constraints, cannot be connected to the LAN cable.

e. **Workstation:** For the purpose of this guide, "workstation" is synonymous with "computer system" and generally refers to the computer, monitor, and associated printer.

f. **UPS:** An uninterruptable power source capable of providing a short period of battery power in the event the main power supply is interrupted. It is intended to provide sufficient power to exit a program and shut off the equipment without losing data.

3. CMOS System. The CMOS system is interconnected by a local area network (LAN) and twisted 4-wire telephone cables. It is composed of host computers, workstations, printers, LAN cable plant, and modems for remote communications.

a. **Ethernet Spine.** The backbone of the system is a central spine (10Base5 Ethernet Cable) which will be routed through the central portion of the TMO offices. Twisted 4-wire cable drops will feed from the spine into the various TMO offices terminating near the intended position for each CMOS workstation.

b. **Cable Drops.** To facilitate installation and maintenance, cable drops will be routed down the interior side of office walls and covered using latching duct. Where possible, cables will be routed above drop ceilings to route between offices. If necessary, the cable may be routed along the exterior walls of the office complex or across the tops of office roofs. Cable drops will be connected to the Ethernet spine using connector or vampire type transceivers. The 10Base5 cable is limited to 500 meters and the twisted 4-wire drops to 50 meters.

c. **Additional Drops.** Cable drops may also be installed for future expansion of the LAN.

d. **Telecommunications.** Each remote workstation will connect to the LAN via a dedicated telephone line. If dedicated lines are not available, then dial-up lines may be substituted. Common examples of remote workstations are the Mobility Control Center and the Transportation Control Center which may be located in different buildings than the TMO. A terminal server will be located in the Central Computer Room to act as the Medium Attachment Unit for the remote communications. The terminal server will interact with the host computers and provide interface to the remotes.

e. **Increment II.** Increment II will add a microcomputer system in each of the mobility workcenters. These will connect to the main CMOS LAN through dedicated or dial-up telephone lines. The nine mobility workcenters are to be implemented under Increment II are: Mobility Control Center (MCC), Transportation Control Unit (TCU), Air Cargo Terminal (ACT), Air Passenger Terminal (APT), Sub-Motor Pool (SMP), LGTX office, Load Planning (LP), interface with the Combat Ammunition System (CAS), and the MAJCOM Logistics Readiness Center (LRC) or its equivalent.

f. **Equipment Layout.** Figures 5-1 through 5-5 and equipment list, Tables 5-1 and 5-2, provide the standard configuration for each type of CMOS workcenter.

4. CMOS Hardware:

a. **Host Computers.** Two AT&T 3B2 computers will be used to maintain the central database, provide communications with other automated systems via connection to the Defense Data Network (DDN), and provide backup for the CMOS database. The System Manager function is collocated with these computers.

b. **UPS.** Two UPSs will be used to provide power filtering and 10 minutes of backup power to the minicomputers.

c. **Microcomputers.** Microcomputers will be UNISYS 80386 computers which will provide processing in the Shipment Planning, Packing and Crating, Surface Freight, and Air Freight workcenters. Increment II workcenters will also use these computers. All order processing, cargo information processing, and form preparation will be done on these machines. In addition, some Zenith Z248 computers may be utilized to augment the system.

d. **Bar Code Readers (scanners).** Bar Code Readers will be obtained from the LOGMARS contract. They will be used to capture inbound cargo data and store information in hand-held terminals (HHT). The data will then be transferred by plugging into one of the workstations or to the LOGMARS interface computer described in section II.C.8. In Increment II, an RF interface capability will be added.

e. **LAN Terminal Server.** This device will connect to the LAN and provide telecommunication serial port connections for all workcenters requiring telephone line connections.

f. **Printers.** The system will use three different types of printers including a medium speed line printer, Dot matrix printers, and laser printers. The line printer is primarily for producing data dumps. The Dot Matrix printers will be used for producing manifests and pin-fed forms and the Laser printers for producing GBLs.

g. **LGTX computer.** This LGTX computer will be a stand-alone TEMPEST secure microcomputer and will not be connected to the CMOS LAN. The CMOS PMO is not responsible for providing a secure location for this equipment.

h. **CAS microcomputer.** The CAS computer will be located with the CAS system and connects to CMOS LAN via one dedicated telephone line. For security reasons, the CAS microcomputer will not be connected to the CAS system.

i. **MAJCOM LRC microcomputer.** The LRC computer will be located at MAJCOM or Numbered Headquarters and connects to the base-level transportation squadron CMOS LAN by dedicated twisted 4-wire comm lines.

j. **Base Radio Station.** The base radio station provides RF capability for the hand-held Bar Code Reader in Increment II. These will operate in the 1.4 Giga Hertz range. (Exact location of the base station will be determined at a later date.

5. Resources To Be Provided By The Base. The base will be responsible for providing the following items to support the CMOS

system and installation. These items will need to be on hand at the time the AT&T minicomputer is installed:

a. Tables and/or desks for computers, printers, and other equipment.

b. Spiker boxes.

c. Power cord adapters (overseas).

d. Paper, ribbons, and toner for the medium speed printer, dot matrix printers, and laser printers.

e. Equipment maintenance after FY 94.

f. Halon fire extinguishers for computer areas.

g. 220/110 step-down transformers (overseas areas only.)

6. Resources To Be Provided By The MAJCOM. The MAJCOM will be responsible for providing the following support:

a. TDY funds needed for site surveys implementation and training (FY 90 and beyond).

b. Manpower for implementation and training.

7. System Maintenance. All computer equipment will be purchased by the program office. Maintenance for the equipment will be funded by CMOS and procured via the contract from which the equipment is ordered until Program Management Requirements Transfer (PMRT).

SECTION II - EQUIPMENT PLACEMENT GUIDELINE

1. General.

The following guidelines provide information on what equipment will be placed in each workcenter and how the equipment should be installed.

2. Facilities.

a. **Consolidate Workcenters.** To enhance operation of the CMOS system, consolidate work areas to the extent possible.

(1) **Central Processor Area.** The Host Central Processor area should be located in an area closest to the majority of the workcenters. (The Host Computers cannot be located in a separate building from those workcenters which will be connected directly to the LAN.) For example, if you have an area in your TMO which contains the administrative offices of two or more of the four functional areas described earlier (Shipment Planning, Packing and Crating, Surface Freight, and Air Freight), then this may be a good area for the host computer. If not, an office with one of the functions which is near to the others may suffice. Collocating as much equipment as possible saves installation costs.

(2) **System Manager Computer System.** Since the System Manager will be primarily responsible for managing the CMOS system, the System Manager computer system should be located in the same area as the AT&T host computers.

b. **Air Conditioning.** If the chosen office space does not have air conditioning, choose another office area with air conditioning in the same general area. If an air conditioned office area is not available, check the allowable operating temperatures as detailed in Annex B. If your office is within these parameters, it should be fine; otherwise, air conditioning may be required. (See Chapter 5, Sect III.)

c. **Altitude.** All equipment shall operate at altitudes from sea level to 8,000 feet.

d. **Fire Protection.** Halon type manual fire extinguishers should be provided within 70 feet of each computer system (consult Base Fire Marshall to obtain these).

e. **Floors.** Equipment shall not require raised flooring. Flooring may be carpeted; however, carpeting will not be funded by CMOS. There will be no special static control facilities.

f. **Space Requirements.** Ensure you have desktop or table-top space available for each of the hardware items to be located in the Central Computer area. (See Tables 5-1 and 5-2) The space requirements for each functional area will range from 36 to 108 square feet of working space, including the operators chair and depending upon the proposed facility layout.

(1) The Central Computer office will require a minimum of 6'x18' work space (108 sq. ft) (Figure 5-1).

(2) Workstation Type A and C: 6'x6' work space (36 sq. ft) (Figure 5-2 and 5-4).

(3) Workstation Type B: 6'x10' work space (60 sq. ft.) (Figure 5-3).

g. **Structure.** No structural alterations are required providing the workcenter is located in an administrative area. The construction of new administrative space will only be approved by the Program Office under unusual site conditions.

3. Equipment Placement.

a. System equipment should be placed away from high traffic areas to avoid possibility of accidents or interference with operator.

b. System equipment should not be placed directly under air conditioners/coolers or close to heaters/radiators.

c. Printers should not be located further than 50 feet from host computers or applicable workstation.

d. System equipment should not be placed in an area subject to unusual dust or other contaminants - i.g. Packing & Crating saw area. If necessary, the equipment should be protected by enclosing in a case, cover, or small temporary type building or shelter (contact DE for assistance.)

e. Equipment should be located close to proper power receptacles. Maximum power cord length is six feet.

f. Equipment must be placed on sturdy tables or desks to avoid accidents. (See Chapter 5, Section II and Annex B, para 2b for space requirements.)

g. The recommended location for workstations is in a properly ventilated, heated, and airconditioned administrative type office for each functional area (Air Freight, Surface Freight, Packing & Crating, Shipment Planning, etc.) Where possible, functions combined into one office would facilitate LAN installation and utility.

4. Equipment Placement Increment II.

a. The same recommendations for Increment I apply to Increment II. In addition, allowances must be made for hooking the system up to a dedicated telephone line. It is also likely that the equipment will be located and used in other areas such as the Squadron Commander's office or TMO Superintendent's office until such time as it is needed for mobility.

b. Since mobility functional areas are not always in permanent facilities, care should be taken to ensure that the facilities used provide adequate protection from the elements such as rain, extreme temperatures, and dirt. These elements can destroy or disable a computer quickly. Where possible, it is strongly encouraged that permanent office type structures be made available for the mobility computer operation.

5. Installation Planning. As part of the installation process, the SETA contractor will develop an installation plan based on information provided in the PSA. This "desktop" engineered plan will rely heavily upon the accuracy and timeliness of the information provided by each base. This information will also be used to order necessary hardware. After initial installation design work is complete, a copy of the installation plan will be sent to the base for review. The Comm XP office should coordinate the plan with LGTT/DE and annotate any discrepancies. After review, the Comm XP should forward copies of the changes, or a message detailing the changes, to SSC/AQFT.

SECTION III - EQUIPMENT SUPPORT REQUIREMENTS

1. **General.** The CMOS equipment shall operate within the facility constraints and environmental tolerances stated below. These are the most stringent requirements of the equipment to be supplied.

2. **Electrical Requirements.**

a. **Power Requirements.** Specific power requirements are obtained from Table 5-3 and the equipment configuration as determined by the Site Survey Team.

b. The equipment will be 120V/60Hz or 230V/50Hz depending on the standard for each base. Most equipment is switchable. All equipment will be provided with standard NEMA plugs. In locations where a 230V/50Hz system is installed, appropriate plug adapters will have to be utilized. These adapters will be locally procured to match the design provided by CE.

c. The Base Civil Engineer will determine if a new electrical panel is required. If so, then the load of the workcenter equipment in the same facilities as the central computer should be fed from the new panel. Power cables should not exceed 125 feet. Equipment located in other facilities should utilize existing circuits. The equipment will plug into a spiker box for protection, which also minimizes the receptacle requirement (See Figures 5-5 and 5-6).

d. Three dedicated 20 amp circuits will be required for the Central Processor area. An additional dedicated circuit and electrical outlets may be provided if desired.

e. **Individual Hardware Requirements.**

(1) The TMO processors and the System Manager computer system should operate with power from commercial sources. Two Uninterruptable Power Sources (UPS) will be supplied with the equipment to provide uninterrupted power to allow graceful degradation and shutdown of the system. All components will be 120 volts 60 Hz or 230 volts 50 Hz single phase, with grounded three-wire NEMA connections. The Government is required to provide panels, conduit or cables, wiring, and required receptacles within 3 feet of each piece of computer hardware as located by the site survey team. The computer hardware requires a solid neutral ground. **WARNING:** Coffee pots, microwave ovens, band saws and other items which could cause electro-magnetic or static interference should not be plugged into the same circuit as the computers.

(2) Two 1KVA UPS, will be provided for the AT&T 3B2 host computers (primary and backup). A separate dedicated 20 amp

circuit is needed for each UPS. A third 1 KVA UPS will be provided for the System Manager computer system. The spiker boxes used for the modem rack, MAU hardware, and the medium speed line printer may be plugged into the third dedicated circuit. (See Figure 5-5.) Several spare outlets should be provided for the addition of new equipment.

(3) Each workcenter computer system (workstation, monitor, and printer) will be plugged into a spiker box which, in turn, requires a standard 20 amp electrical receptacle (may be different overseas.) A dedicated circuit is not required. (See Figure 5-6.)

3. Access. Normal office-size doorways will be adequate for personnel to install systems in office buildings. Sufficient cleared space around computer location must be made available to allow access by installation contractor. If access to controlled areas is required, then badges or escorts must be provided.

4. Air Conditioning. The ambient temperature will be maintained by the Government between 60 and 90 degrees F., with a relative humidity of between 20 and 80 percent noncondensing. No static electricity control or chilled water facilities will be required. Dust control is only required in areas that do not meet administrative facility standards.

a. Specific heat load can be obtained from Table 5-3 and the equipment configuration as determined by the Site Survey Team. Only the load created by the equipment should be considered. Any capacity above this amount must be justified through the Program Office.

b. Demand factors in Table 5-3 indicate the approximate operating time of the equipment and should be considered when determining actual requirements.

c. The existing cooling system should be utilized when at all possible. Rebalancing, enlargement of supply ducts, and increasing blower speeds should be considered prior to the use of supplemental cooling equipment. The extraction of excess heat via exhaust fans should be considered where practical.

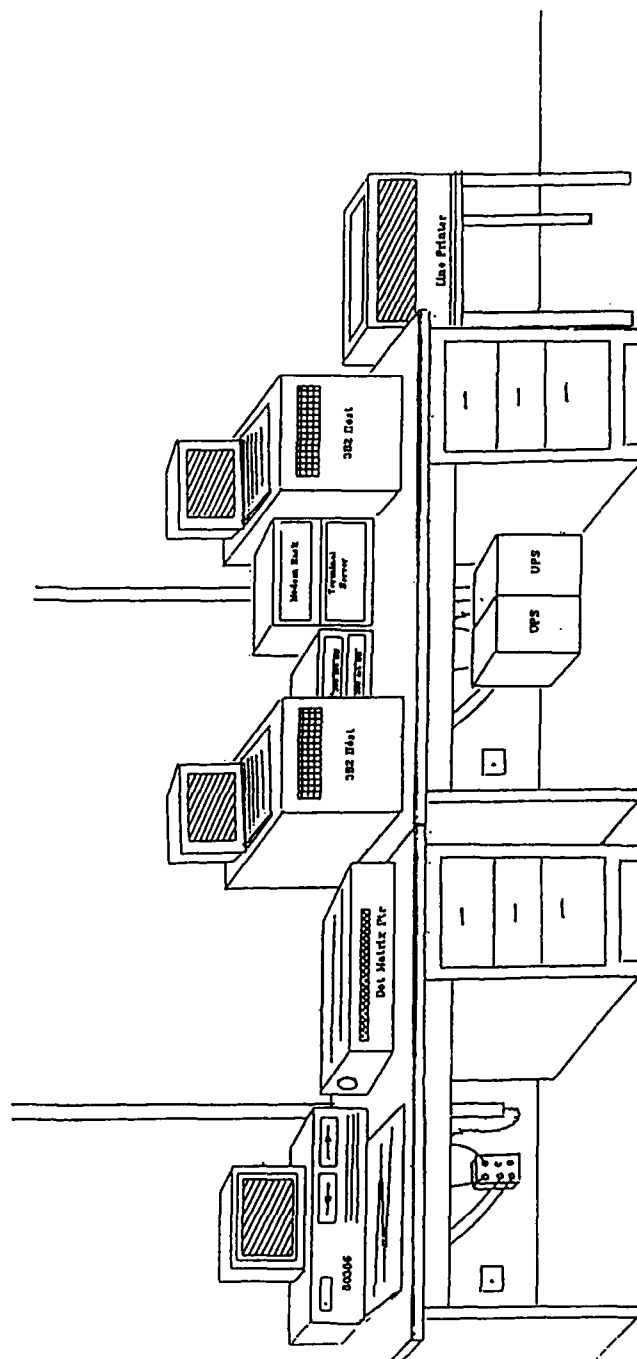
d. The CMOS equipment should require no supplemental cooling when installed in normal administrative areas. The requirement for additional cooling in workcenters must be justified through the Program Office.

e. The workcenter sketches should include A/C diffuser locations and sizes when additional A/C is required.

f. Window-type air conditioners should be considered when there is a need for air conditioner equipment.

CMOS

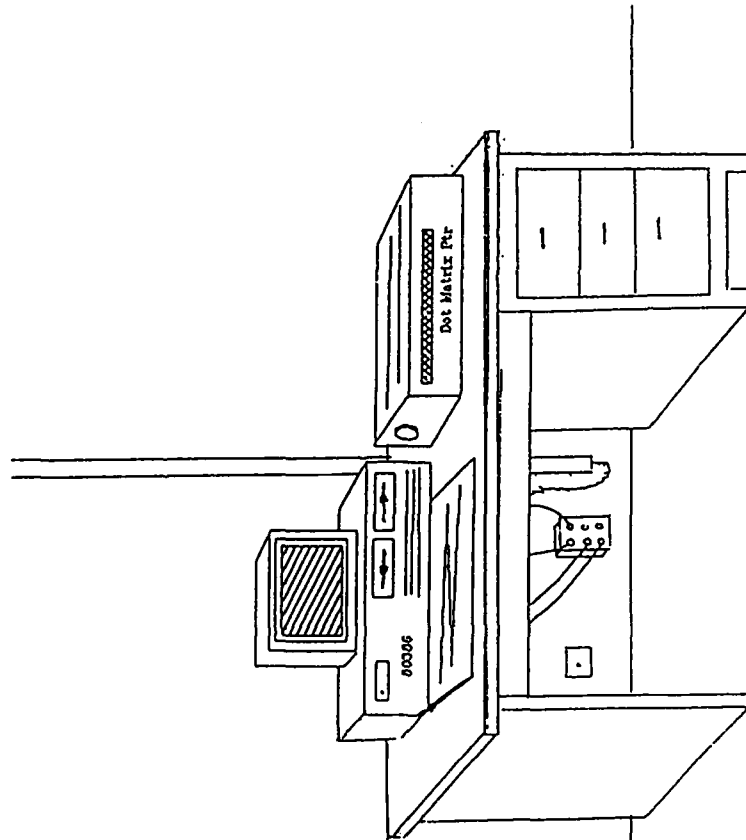
CENTRAL COMPUTER & SYSTEM MANAGER WORKCENTER



Central Computer Work Center
Figure 5-1

CMOS

TYPE A WORKCENTER LAYOUT



APPLICABLE WORKCENTERS

System Manager
Shipment Planning
Air Passenger Terminal *
Air Clearance Authority *
Mobility Control Center *
Sub Motor Pool *
CAS-B *
Logistics Readiness Center, HQ *
LGTX (Tempest Terminal) **

SYSTEM COMPONENTS

1 - Workstation
1 - Dot Matrix Printer
* 1 - Modem
** No LAN or COMM Connection

Type A Work Center Layout
Figure 5-2

CMOS

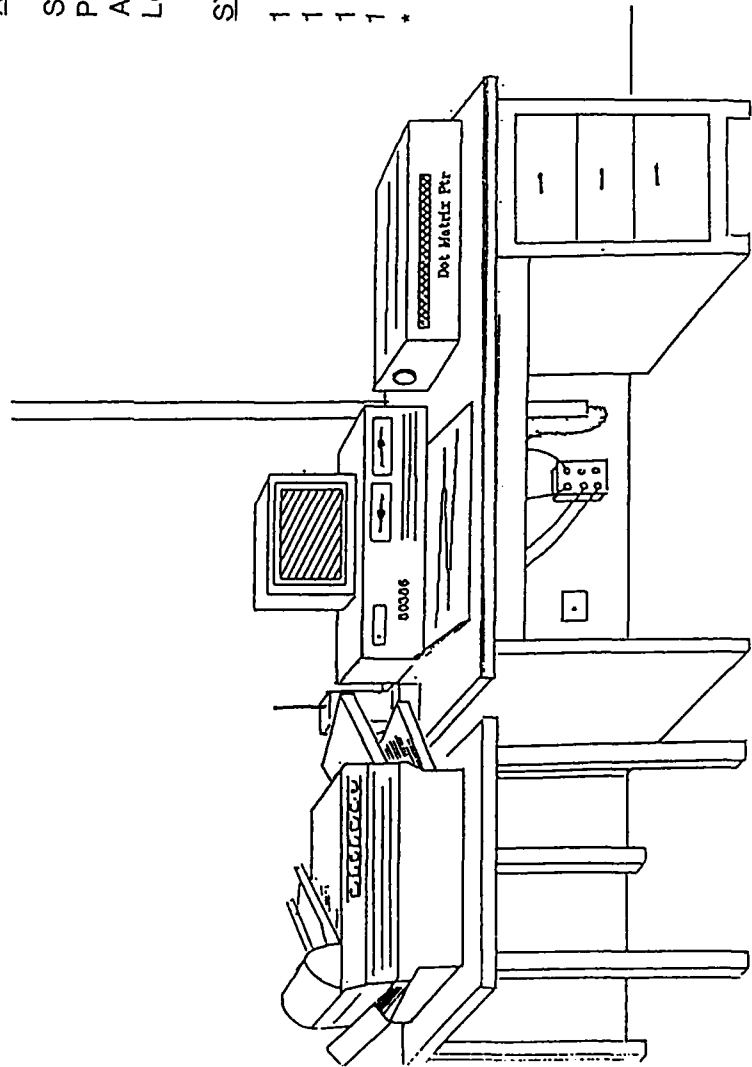
TYPE B WORKCENTER LAYOUT

APPLICABLE WORKCENTERS

Surface Freight
Packing & Crating *
Air Cargo Terminal *
Load Planning *

SYSTEM COMPONENTS

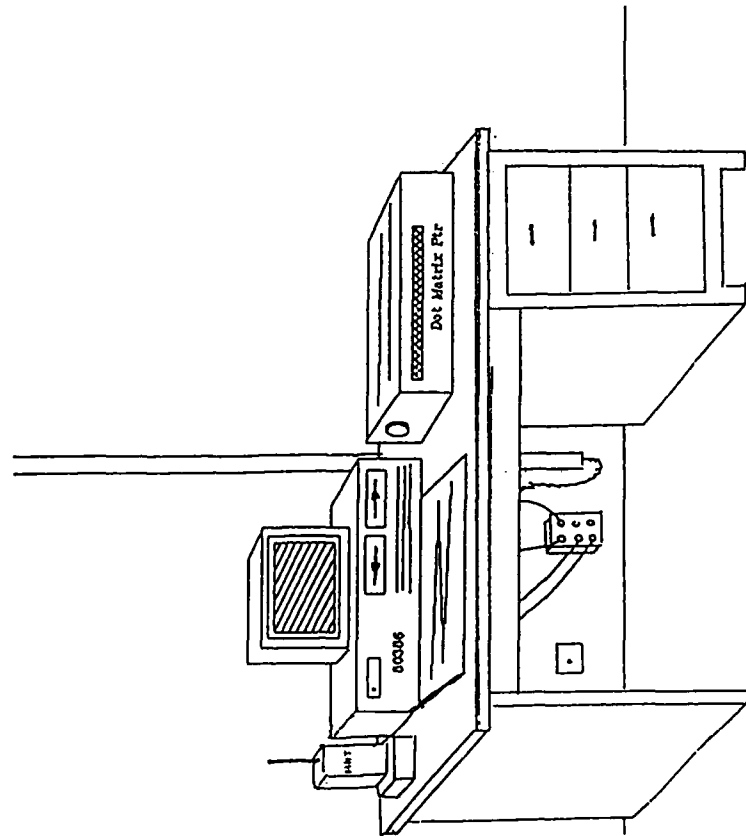
1 - Workstation
1 - Dot Matrix Printer
1 - Hand Held Terminal
1 - Laser Printer
* 1 - Modem



Type B Work Center Layout
Figure 5-3

CMOS

TYPE C WORKCENTER LAYOUT



APPLICABLE WORKCENTERS

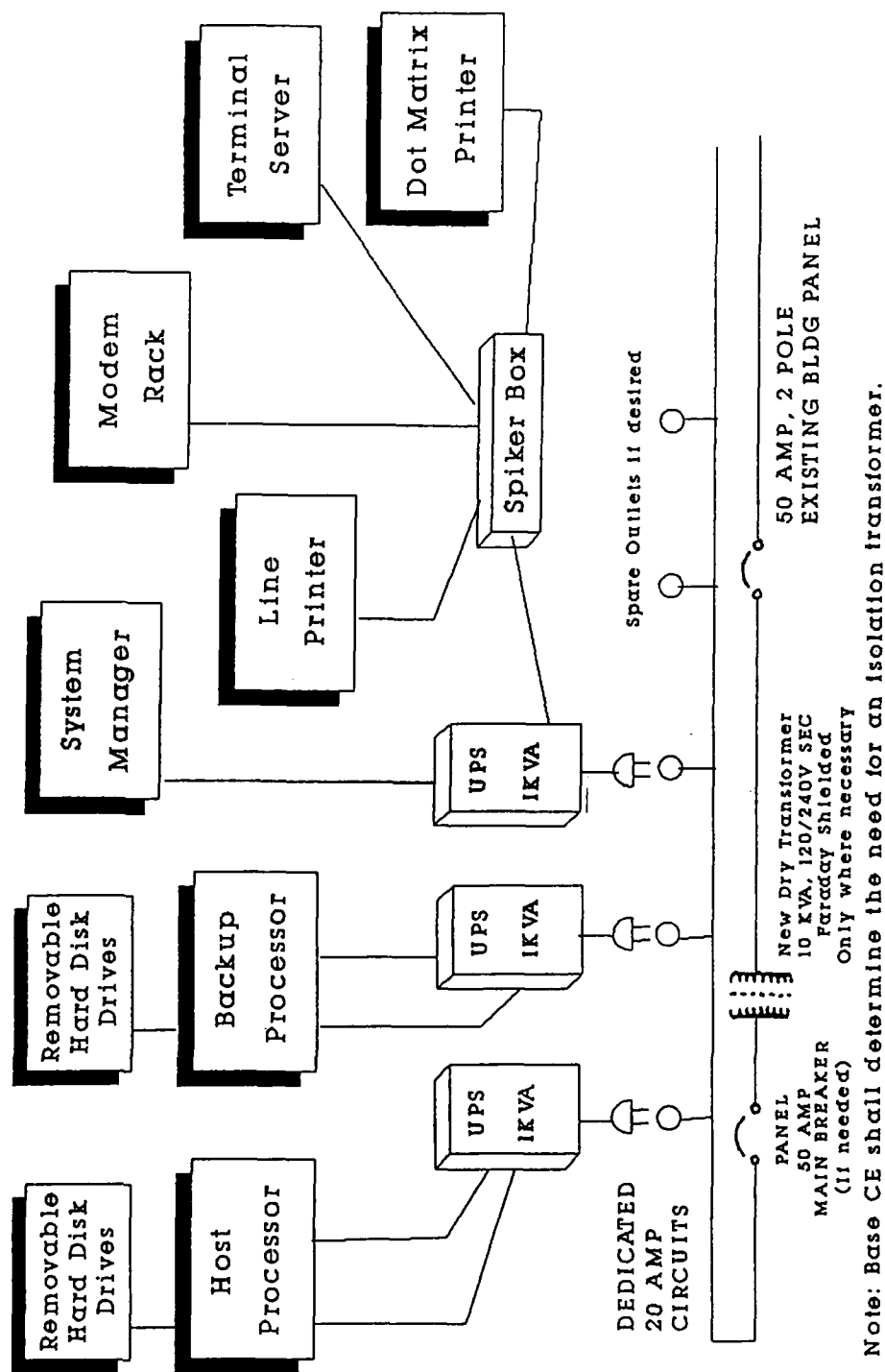
Air Freight
Trans Control Unit

SYSTEM COMPONENTS

1 - Workstation
1 - Dot Matrix Printer
1 - Hand Held Terminal
1 - Modem

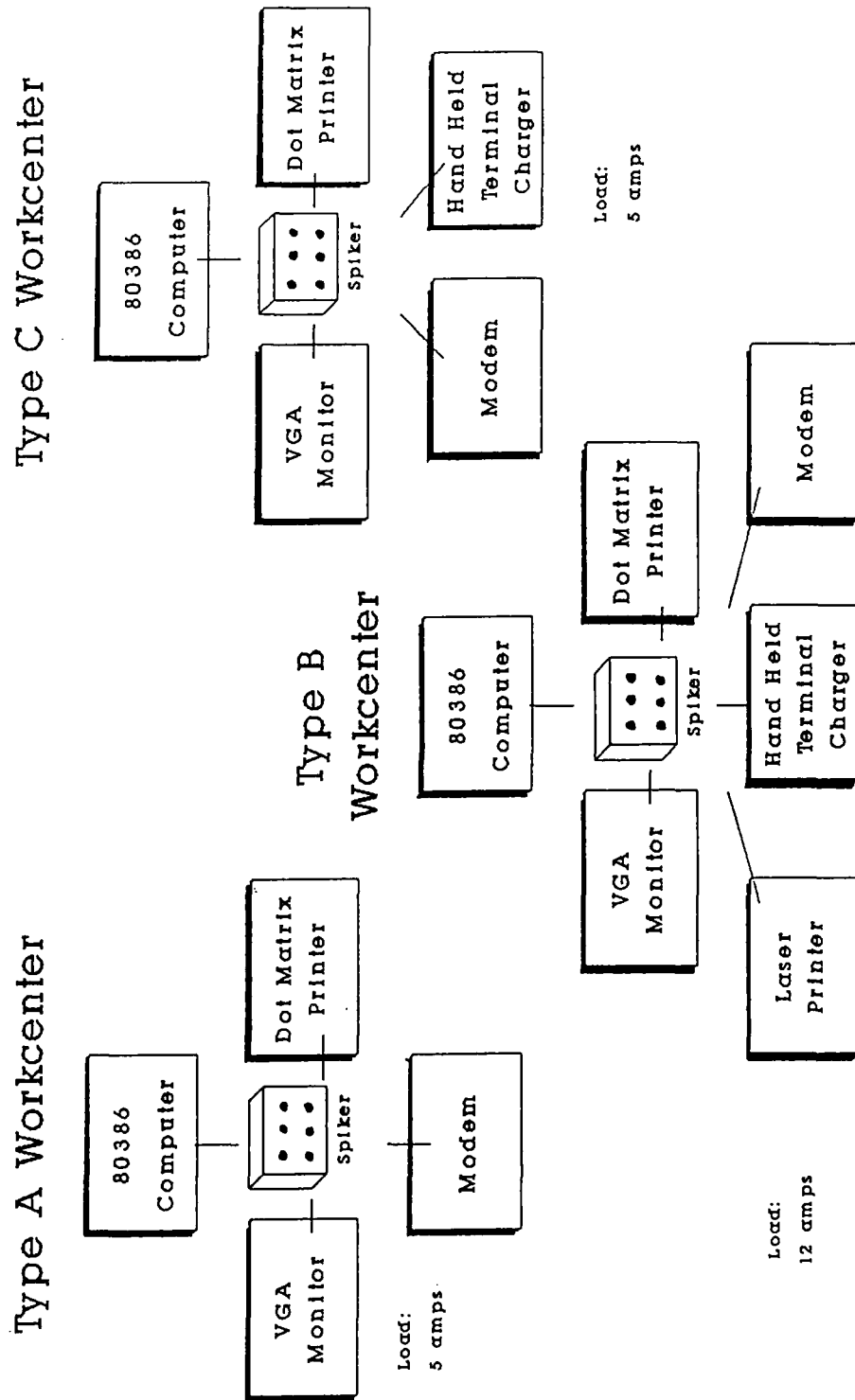
Type C Work Center Layout
Figure 5-4

CENTRAL PROCESSOR AREA (TMO CENTER) (120 Volt, 60 HZ Application)



Central Processor Area (TMO Center)
(120 Volt, 60 hz Application)
Figure 5-5

WORKSTATION LAYOUTS (120 Volt, 60 HZ Application)



Workstation Layouts
(120 Volt, 60 hz Application)
Figure 5-6

Table 5-1 CMOS CENTRAL COMPUTER EQUIPMENT

AT&T 3B2 Units	2 ea
LAN Cable 10Base5	1 ea
DDN Modems	1 ea
Modems for Modem Rack	8 ea
Modem Rack	1 ea
LAN Terminal Server	1 ea
Line Printer, Medium Speed	1 ea
CADS (Removable Hard Disk Drives)	2 ea

Table 5-2 CMOS WORKCENTER SYSTEM EQUIPMENT

	Hardware: Increment I Sect	Workstation 80386	Dot Mat Printer	Laser Printer	Modem	Hand Held Terminal/Charger
I N C R E M E N T	System Manager	1	1			
	Air Freight	1	1		1	1
	Surface Freight	1	1	1		1
	Shipment Planning	1	1			
	Packing & Crating	1	1	1		1
	Air Clearance Auth	1	1		1	
I N C R E M E N T	Mob Control Center	1	1		1	
	Transp Ctrl Center	1	1		1	1
	Air Cargo Terminal	1	1	1	1	2
	Air Pas Terminal	1	1		1	
	Sub-Motor Pool	1	1		1	
	Load Planning	1	1	1	1	
II	MAJCOM LRC	1	1		1	
	Combat Ammun Sys	1	1		1	
	LGTX (Tempest)	1	1			

Table 5-3 EQUIPMENT DIMENSIONS/POWER/HEAT CRITERIA

EQUIPMENT	SIZE	WATTS	STARTING AMPS		DEMAND FACTOR %	POWER	NOTES
			CONUS/OS	BTUH			
AT&T 3B2 Computer	13"h x 17"w x 25"d	550	7.5/3.3	1700	100	90-132VAC; 180-264VAC	1.2,3,6
AT&T 3B2 Monitor	16"h x 13"w x 13"d	100	2/1.2	--	100		1.2
AT&T Racks	52"h x 24"w x 32"d	--	--	--	--		1.2
CADS (Rem Hard Disks)	5"h x 17"w x 22"d	88	5/3	--	50		1.2
UPS (2KVA)	32"h x 16"w x 24"d	1300	15/11	200	100		1.2,4
UPS (1KVA)	5"h x 13"w x 14"d	650	8/6	150	100		1.2
Med Speed Line Printer	36"h x 27"w x 29"d	720	6/3	4600	15	120VAC, 60hz or 720VAC, 50hz	1.2,4
LAN Terminal Servier	6"h x 19"w x 18"d	120	1/0.5	300	100		1.2
Workstations	7"h x 21"w x 17"d	360	3/1.5	600	100		1.2
Workstation Monitor	14"h x 14"w x 15"d	400	7/3.5	600	100		1.2
Dot Matrix Printer	6"h x 26"w x 18"d	250	2/1	600	60		1.2,7
Laser Printer	15"h x 18"w x 24"d	960	8/4	2000	40		1.2
Spiker Box	varied	--	--	--	100		1.2,5
Hand-Held Term + Chgr	8"h x 1"w x 3"d	--	--	--	30		1.2,5
Limited Dist Modem	3"h x 9"w x 9"d	12	.1/.05	20	100		1.2
Modem Rack	13"h x 20"w x 10"d	360	6/3	300	100		1.2,8

NOTES:

1. All dimensions are to the nearest inch.
2. See Figures 5-5 and 5-6 for electrical connections.
3. Two host computers are required, each powered through a separate UPS.
4. Will require a dedicated 20 amp circuit for 120V applications and a 10 amp circuit for 230V applications.
5. Very minimal power draw.
6. Fully configured 3B2-600 draws 900 watts. CMOS configured 3B2 will draw only 550 watts.
7. Approximately 13" is needed behind printer for paper.
8. Load depends on number of cards installed. Maximum load is shown.

ANNEX A
INSTALLATION SCHEDULE
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TABLE A-1

INSTALLATION / EQUIPMENT SCHEDULE

(* = ADAM-3 sites | r = AFR sites | x = Potential Base Closures)

INCREMENT I

INCREMENT II

Seq Base MAJCOM Eq Del Install/ROD Eq Del Install/ROD

**1. INITIAL QUALIFICATION OPERATIONAL TEST AND EVALUATION
OOT&E, TRAINING AND LABORATORY SITES.**

1	EGLIN AFB, FL	AFSC	NOV 89	NOV 89	DEC 91	FEB 92
2	LANGLEY AFB, VA	TAC	NOV 89	APR 90	JUL 90	DEC 91
3	SEYMOUR JOHNSON AFB, NC	TAC	NOV 89	APR 90	JUL 90	DEC 91
4 *	DOVER AFB, DE	MAC	DEC 89	APR 90	DEC 90	JUN 91
5	SHAW AFB, SC	TAC	NOV 89	MAY 90	SEP 90	DEC 91
6	SCOTT AFB, IL	MAC	NOV 89	MAY 90	DEC 91	MAR 92
7	MAXWELL AFB, AL	AU	NOV 89	MAY 90	DEC 91	MAR 92
8 *	RAMSTEIN AB, GE	USAFE	NOV 89	JUN 90	DEC 90	JUN 91
9 *	KADENA AB, JA	PACAF	NOV 89	JUN 90	DEC 90	JUN 91
10	WRIGHT-PATTERSON AFB, OH	AFLC	NOV 89	JUL 90	DEC 91	FEB 92
11	SHEPPARD TTC, TX	ATC	NOV 89	JUL 90	DEC 91	MAR 92
12	BARKSDALE AFB, LA	SAC	NOV 89	JUL 90	DEC 91	MAR 92

2. TACTICAL AIR COMMAND (TAC) INSTALLATION SCHEDULE

1 x	MYRTLE BEACH AFB, SC	TAC	JAN 90	NOV 90	DEC 92	MAR 93
2	MOODY AFB, GA	TAC	JAN 90	NOV 90	DEC 92	MAR 93
3	HOMESTEAD AFB, FL	TAC	JAN 90	NOV 90	DEC 92	MAR 93
4	MACDILL AFB, FL	TAC	JAN 90	NOV 90	DEC 92	MAR 93
5	TYNDALL AFB, FL	TAC	JAN 90	NOV 90	DEC 92	MAR 93
6	ENGLAND AFB, LA	TAC	JAN 90	NOV 90	DEC 92	MAR 93
7 x	BERGSTROM AFB, TX	TAC	MAR 90	DEC 90	JAN 93	APR 93
8	CANNON AFB, NM	TAC	MAR 90	DEC 90	JAN 93	APR 93
9	MOUNTAIN HOME AFB, ID	TAC	MAR 90	DEC 90	JAN 93	APR 93
10 *	HOWARD AB, CZ	TAC	MAR 90	DEC 90	JAN 93	APR 93
11	HOLLOMAN AFB, NM	TAC	MAR 90	DEC 90	JAN 93	APR 93
12	DAVIS MONTHAN AFB, AZ	TAC	MAR 90	DEC 90	JAN 93	APR 93
13	LUKE AFB, AZ	TAC	MAY 90	JAN 91	FEB 93	MAY 93
14	NELLIS AFB, NV	TAC	MAY 90	JAN 91	FEB 93	MAY 93

3. STRATEGIC AIR COMMAND (SAC) INSTALLATION SCHEDULE

1	LORING AFB, ME	SAC	MAY 90	JAN 91	FEB 93	MAY 93
2	PLATTSBURGH AFB, NY	SAC	MAY 90	JAN 91	FEB 93	MAY 93
3	GRIFFISS AFB, NY	SAC	MAY 90	JAN 91	FEB 93	MAY 93
4	WURTSMITH AFB, MI	SAC	MAY 90	JAN 91	FEB 93	MAY 93
5	K.I. SAWYER AFB, MI	SAC	JUN 90	FEB 91	MAR 93	JUN 93
6	GRISSOM AFB, IN	SAC	JUN 90	FEB 91	MAR 93	JUN 93
7	OFFUTT AFB, NE	SAC	JUN 90	FEB 91	MAR 93	JUN 93
8	WHITEMAN AFB, MO	SAC	JUN 90	FEB 91	MAR 93	JUN 93
9	MCCONNELL AFB, KS	SAC	JUN 90	FEB 91	MAR 93	JUN 93

TABLE A-1, Installation / Equipment Schedule, Cont....

SEQ	BASE	MAJCOM	INCREMENT I		INCREMENT II	
			EQ.DEL.	INSTALL/ROD	EQ.DEL.	INSTALL/ROD

3. SAC Continued.....

10 x	EAKER AFB, AR	SAC	JUN 90	FEB 91	MAR 93	JUN 93
11	DYESS AFB, TX	SAC	JUL 90	MAR 91	APR 93	JUL 93
12	F.E. WARREN AFB, WY	SAC	JUL 90	MAR 91	APR 93	JUL 93
13	MINOT AFB, ND	SAC	JUL 90	MAR 91	APR 93	JUL 93
14	MALMSTROM AFB, MT	SAC	JUL 90	MAR 91	APR 93	JUL 93
15	FAIRCHILD AFB, WA	SAC	JUL 90	MAR 91	APR 93	JUL 93
16	CASTLE AFB, CA	SAC	AUG 90	APR 91	MAY 93	AUG 93
17	VANDENBERG AFB, CA	SAC	AUG 90	APR 91	MAY 93	AUG 93
18	CARSWELL AFB, TX	SAC	AUG 90	APR 91	MAY 93	AUG 93
19	ELLSWORTH AFB, SD	SAC	AUG 90	APR 91	MAY 93	AUG 93
20	GRAND FORKS AFB, ND	SAC	AUG 90	APR 91	MAY 93	AUG 93
21	BEALE AFB, CA	SAC	AUG 90	APR 91	MAY 93	AUG 93
22	MARCH AFB, CA	SAC	SEP 90	MAY 91	JUN 93	SEP 93

4. MILITARY AIRLIFT COMMAND (MAC) INSTALLATION SCHEDULE

1	HURLBURT FLD, FL	MAC	SEP 90	MAY 91	JUN 93	SEP 93
2	POPE AFB, NC	MAC	SEP 90	MAY 91	JUN 93	SEP 93
3	ANDREWS AFB, DC	MAC	DEC 90	MAY 91	JUN 93	SEP 93
4 *	MCGUIRE AFB, NJ	MAC	DEC 90	MAY 91	JUN 93	SEP 93
5	NORFOLK NAS, VA	NAVY	DEC 90	MAY 91	JUN 93	SEP 93
6 x	KIRTLAND AFB, NM	MAC	DEC 90	MAY 91	JUN 93	SEP 93
7	LITTLE ROCK AFB, AR	MAC	DEC 90	JUN 91	JUL 93	OCT 93
8	ALTUS AFB, OK	MAC	DEC 90	JUN 91	JUL 93	OCT 93
9 *	CHARLESTON AFB, SC	MAC	DEC 90	JUN 91	JUL 93	OCT 93
10 *	TRAVIS AFB, CA	MAC	DEC 90	JUN 91	JUL 93	OCT 93
11 *	MCCHORD AFB, WA	MAC	DEC 90	JUN 91	JUL 93	OCT 93

5. USAF EUROPE (USAFE) INSTALLATION SCHEDULE

1	SPANGDAHLEM AB, GE	USAFE	FEB 91	JUL 91	AUG 93	NOV 93
2	HESSISCH-OLDENDORF AS, GE	USAFE	FEB 91	JUL 91	AUG 93	NOV 93
3	LEIPHEIM AB, GE	USAFE	FEB 91	JUL 91	AUG 93	NOV 93
4	AHLHORN AB, GE	USAFE	FEB 91	JUL 91	AUG 93	NOV 93
5	NORVENICH AB, GE	USAFE	FEB 91	AUG 91	AUG 93	DEC 93
6	MORBACH AB, GE	USAFE	FEB 91	AUG 91	AUG 93	DEC 93
7	BITBURG AB, GE	USAFE	MAR 91	AUG 91	SEP 93	DEC 93
8	HAHN AB, GE	USAFE	MAR 91	AUG 91	SEP 93	DEC 93
9 x	ZWEIBRUCKEN AB, GE	USAFE	MAR 91	SEP 91	SEP 93	JAN 94
10	SEMBACH AB, GE	USAFE	MAR 91	SEP 91	SEP 93	JAN 94
11 *	RHEIN MAIN AB, GE	MAC	MAR 91	SEP 91	SEP 93	JAN 94
12	TEMPLEHOF GEN ARPT, GE	USAFE	MAR 91	SEP 91	SEP 93	JAN 94
13	RAF LAKENHEATH, UK	USAFE	APR 91	OCT 91	OCT 93	FEB 94

TABLE A-1, Installation / Equipment Schedule, Cont....

SEQ	BASE	MAJCOM	INCREMENT I		INCREMENT II	
			EQ.DEL.	INSTALL/ROD	EQ.DEL.	INSTALL/ROD
5. USAFE Continued.....						
14	RAF ALCONBURY, UK	USAFE	APR 91	OCT 91	OCT 93	FEB 94
15	RAF KEMBLE, UK	AFLC	APR 91	OCT 91	OCT 93	FEB 94
16 x	RAF FAIRFORD, UK	USAFE	APR 91	OCT 91	OCT 93	FEB 94
17	RAF CHICKSANDS, UK	USAFE	APR 91	NOV 91	OCT 93	MAR 94
18 *	RAF MILDENHALL, UK	USAFE	APR 91	NOV 91	OCT 93	MAR 94
19	RAF BENTWATERS, UK	USAFE	MAY 91	NOV 91	NOV 93	MAR 94
20	RAF UPPER HEYFORD, UK	USAFE	MAY 91	NOV 91	NOV 93	MAR 94
21 x	RAF GREENHAM COMMON, UK	USAFE	MAY 91	DEC 91	NOV 93	APR 94
22	SOESTERGBERG AB, NETH	USAFE	MAY 91	DEC 91	NOV 93	APR 94
23	OSLO, NO	USAFE	MAY 91	DEC 91	NOV 93	APR 94
24	SAN VITO AS, IT	USAFE	MAY 91	DEC 91	NOV 93	APR 94
25	NAPLES NAS, IT	NAVY	JUN 91	JAN 91	DEC 93	MAY 94
26	COMISO AS, IT	USAFE	JUN 91	JAN 92	DEC 93	MAY 94
27	DECIMOMANNU AS, IT	USAFE	JUN 91	JAN 92	DEC 93	MAY 94
28	AVIANO AB, IT	USAFE	JUN 91	JAN 92	DEC 93	MAY 94
29 *	HELLENIKON AB, GR	USAFE	JUN 91	JAN 92	DEC 93	MAY 94
30	IRAKLION AS, CR	USAFE	JUN 91	FEB 92	DEC 93	MAY 94
31 *	INCIRLIK AB, TU	USAFE	DEC 91	FEB 92	DEC 91	FEB 92
32	ANKARA AS, TU	USAFE	DEC 91	FEB 92	DEC 91	FEB 92
33	PIRINCLIK AS, TU	USAFE	DEC 91	FEB 92	DEC 91	FEB 92
34	IZMIR, TU	USAFE	DEC 91	MAR 92	DEC 91	MAR 92
35 *	TORREJON AB, SP	USAFE	DEC 91	MAR 92	DEC 91	MAR 92
36	MORON AB, SP	USAFE	DEC 91	MAR 92	DEC 91	MAR 92
37	ZARAGOZA AB, SP	USAFE	DEC 91	APR 92	DEC 91	APR 92
38	SIGONELLA NAS, SP	NAVY	DEC 91	APR 92	DEC 91	APR 92
39	ROTA, SP	NAVY	DEC 91	APR 92	DEC 91	APR 92
40 *	LAJES FLD, AZ	MAC	DEC 91	APR 92	DEC 91	APR 92
6. ALASKAN AIR COMMAND (AAC) INSTALLATION SCHEDULE						
1 *	ELMENDORF AFB, AK	AAC	DEC 91	MAY 92	DEC 91	MAY 92
2	EIELSON AFB, AK	AAC	DEC 91	MAY 92	DEC 91	MAY 92
7. PACIFIC AIR COMMAND (PACAF) INSTALLATION SCHEDULE						
1 *	HICKAM AFB, HI	PACAF	DEC 91	JUN 92	DEC 91	JUN 92
2 *	ANDERSEN AFB, GU	PACAF	DEC 91	JUN 92	DEC 91	JUN 92
3	CUBI POINT NAS, PI	NAVY	DEC 91	JUL 92	DEC 91	JUL 92
4	DIEGO GARCIA	NAVY	DEC 91	JUL 92	DEC 91	JUL 92
5 *	CLARK AB, PI	PACAF	DEC 91	JUL 92	JAN 92	JUL 92
6 *	YOKOTA AB, JA	PACAF	DEC 91	AUG 92	JAN 92	AUG 92
7 *	OSAN AB, KS	PACAF	DEC 91	AUG 92	JAN 92	AUG 92
8	KUNSAN AB, KS	PACAF	DEC 91	AUG 92	JAN 92	AUG 92

TABLE A-1, Installation / Equipment Schedule, Cont....

SEQ	BASE	MAJCOM	INCREMENT I		INCREMENT II	
			EQ.DEL.	INSTALL/ROD	EQ.DEL.	INSTALL/ROD
7. PACAF Continued.....						
9	MISAWA AB, JA	PACAF	DEC 91	SEP 92	JAN 92	SEP 92
10 x	TAEGU AB, KS	PACAF	DEC 91	SEP 92	JAN 92	SEP 92
11 x	KWANG JU AB, KS	PACAF	JAN 92	SEP 92	JAN 92	SEP 92
12 x	SUWON AB, KS	PACAF	JAN 92	SEP 92	JAN 92	SEP 92
8. AIR FORCE SYSTEMS COMMAND (AFSC) INSTALLATION SCHEDULE						
1	HANSCOM AFB, MA	AFSC	JAN 92	OCT 92	JAN 92	OCT 92
2	PATRICK AFB, FL	AFSC	JAN 92	OCT 92	JAN 92	OCT 92
3	EDWARDS AFB, CA	AFSC	JAN 92	OCT 92	JAN 92	OCT 92
4 x	LOS ANGELES AFS, CA	AFSC	JAN 92	OCT 92	JAN 92	OCT 92
5	BROOKS AFB, TX	AFSC	FEB 92	OCT 92	FEB 92	OCT 92
9. SPACE COMMAND (SPACECOM) INSTALLATION SCHEDULE						
1	PETERSON AFB, CO	SPCMD	FEB 92	NOV 92	FEB 92	NOV 92
10. AIR TRAINING COMMAND (ATC) INSTALLATION SCHEDULE						
1	SHEPPARD AFB, TX	ATC	FEB 92	NOV 92	FEB 92	NOV 92
2	RANDOLPH AFB, TX	ATC	FEB 92	NOV 92	FEB 92	NOV 92
3	COLUMBUS AFB, OH	ATC	FEB 92	NOV 92	FEB 92	NOV 92
4	WILLIAMS AFB, AZ	ATC	FEB 92	NOV 92	FEB 92	NOV 92
5	REESE AFB, TX	ATC	MAR 92	DEC 92	MAR 92	DEC 92
6	VANCE AFB, OK	ATC	MAR 92	DEC 92	MAR 92	DEC 92
7	GOODFELLOW AFB, TX	ATC	MAR 92	DEC 92	MAR 92	DEC 92
8	KEESLER AFB, MS	ATC	MAR 92	DEC 92	MAR 92	DEC 92
9	LACKLAND AFB, TX	ATC	MAR 92	DEC 92	MAR 92	DEC 92
10	LOWRY AFB, CO	ATC	MAR 92	JAN 93	MAR 92	JAN 93
11	LAUGHLIN AFB, TX	ATC	APR 92	JAN 93	APR 92	JAN 93
11. AIR FORCE ACADEMY (AFA) INSTALLATION SCHEDULE						
1	HQ USAF ACADEMY, CO	AFA	APR 92	JAN 93	APR 92	JAN 93
12. AIR FORCE LOGISTICS COMMAND (AFLC) INSTALLATION SCHEDULE						
1	MCCLELLAN AFB, CA	AFLC	APR 92	JAN 93	APR 92	JAN 93
2	ROBINS AFB, GA	AFLC	APR 92	FEB 93	APR 92	FEB 93
3	TINKER AFB, OK	AFLC	APR 92	FEB 93	DEC 91	FEB 93
4	KELLY AFB, TX	AFLC	MAY 92	FEB 93	DEC 91	FEB 93
5	NEWARK AFB, OH	AFLC	MAY 92	FEB 93	DEC 91	FEB 93
6	HILL AFB, UT	AFLC	MAY 92	FEB 93	DEC 91	FEB 93

TABLE A-1, Installation / Equipment Schedule, Cont....

SEQ	BASE	MAJCOM	INCREMENT I		INCREMENT II	
			EQ.DEL.	INSTALL/ROD	EQ.DEL.	INSTALL/ROD
13. AIR NATIONAL GUARD AND AIR FORCE RESERVE (ANG/RES) INSTALLATION SCHEDULE						
1	Duluth IAP, MN	ANG	DEC 92	JAN 93	DEC 92	JAN 93
2	Selfridge ANGB, MI	ANG	DEC 92	JAN 93	DEC 92	JAN 93
1 r	Westover AFB, MA	AFR	DEC 92	JAN 93	DEC 92	JAN 93
2 r	Dobbins AFB, GA	AFR	DEC 92	FEB 93	DEC 92	FEB 93
3	Jacksonville IAP, Jackson	ANG	FEB 93	MAR 93	FEB 93	MAR 93
4	Savannah MAP, Garden City	ANG	FEB 93	MAR 93	FEB 93	MAR 93
5	FTS GA, Savannah MAP, Gar	ANG	FEB 93	MAR 93	FEB 93	MAR 93
6	McEntire ANGB, Eastover, ANG	ANG	FEB 93	MAR 93	FEB 93	MAR 93
7	Charlotte/Douglas IAP, Ch	ANG	FEB 93	MAR 93	FEB 93	MAR 93
8	McGhee Tyson APT, Knoxvil	ANG	FEB 93	MAR 93	FEB 93	MAR 93
9	Nashville Metro APT, Nash	ANG	MAR 93	APR 93	MAR 93	APR 93
10	Dobbins AFB, GA	ANG	MAR 93	APR 93	MAR 93	APR 93
11	Birmingham MAP, AL	ANG	MAR 93	APR 93	MAR 93	APR 93
12	Dannelly Fld, Montgomery,	ANG	MAR 93	APR 93	MAR 93	APR 93
13	Byrd IAP, Sandstone, VA	ANG	APR 93	MAY 93	APR 93	MAY 93
14	Willow Grove ARF, PA	ANG	APR 93	MAY 93	APR 93	MAY 93
3 r	Willow Grove ARF, PA	AFR	APR 93	MAY 93	APR 93	MAY 93
15	Andrews AFB, MD	ANG	APR 93	MAY 93	APR 93	MAY 93
16	Glenn L. Martin St APT, B	ANG	APR 93	MAY 93	APR 93	MAY 93
17	Greater Wilmington APT, N	ANG	MAY 93	JUN 93	MAY 93	JUN 93
18	Langley ANG, Atlantic Cit	ANG	MAY 93	JUN 93	MAY 93	JUN 93
19	McGuire AFB, NJ	ANG	MAY 93	JUN 93	MAY 93	JUN 93
20	Harrisburg IAP, Middletow	ANG	MAY 93	JUN 93	MAY 93	JUN 93
21	Eastern WVA RAP, Martinsb	ANG	MAY 93	JUN 93	MAY 93	JUN 93
22	Hancock FLD, Syracuse, NY	ANG	JUN 93	JUL 93	JUN 93	JUL 93
23	Schenectady CAP, NY	ANG	JUN 93	JUL 93	JUN 93	JUL 93
24	Burlington IAP, VT	ANG	JUN 93	JUL 93	JUN 93	JUL 93
25	Bangor ANGB, ME	ANG	JUN 93	JUL 93	JUN 93	JUL 93
26	Pease AFB, NH	ANG	JUL 93	AUG 93	JUL 93	AUG 93
27	Barnes MAP, MA	ANG	JUL 93	AUG 93	JUL 93	AUG 93
28	Otis ANGB, MA	ANG	JUL 93	AUG 93	JUL 93	AUG 93
29	Quonset SAP, North Kingto	ANG	JUL 93	AUG 93	JUL 93	AUG 93
30	Bradley ANGB, East Granby	ANG	JUL 93	AUG 93	JUL 93	AUG 93
31	Stewart IAP, Newburgh, NY	ANG	JUL 93	AUG 93	JUL 93	AUG 93
32	Suffolk CAP, West Hampton	ANG	AUG 93	SEP 93	AUG 93	SEP 93
33	Standiford Fld, Louisvill	ANG	AUG 93	SEP 93	AUG 93	SEP 93
34	Hulman RAP, Terre Haute, ANG	ANG	AUG 93	SEP 93	AUG 93	SEP 93
35	Phelps-Collins ANGB, Alpe	ANG	SEP 93	OCT 93	SEP 93	OCT 93
36	BattleCreek ANGB, MI	ANG	SEP 93	OCT 93	SEP 93	OCT 93

TABLE A-1, Installation / Equipment Schedule, Cont....

SEQ	BASE	MAJCOM	INCREMENT I		INCREMENT II	
			EQ.DEL.	INSTALL/ROD	EQ.DEL.	INSTALL/ROD
13. ANG/RES Continued.....						
37	Ft Wayne MAP, IN	ANG	SEP 93	OCT 93	SEP 93	OCT 93
38	Toledo EXP APT, Swanton, ANG	ANG	SEP 93	OCT 93	SEP 93	OCT 93
39	Mansfield Lahm APT, MansfANG	ANG	SEP 93	OCT 93	SEP 93	OCT 93
40	Rickenbacker ANGB, OH	ANG	OCT 93	NOV 93	OCT 93	NOV 93
41	Springfield ANGB, SpringfANG	ANG	OCT 93	NOV 93	OCT 93	NOV 93
42	O'Hare ARFF, Chicago, IL	ANG	OCT 93	NOV 93	OCT 93	NOV 93
4 r	O'Hare ARFF, IL	AFR	OCT 93	NOV 93	OCT 93	NOV 93
43	Volk Fld ANGB, Camp DouglANG	ANG	NOV 93	DEC 93	NOV 93	DEC 93
44	Gen Mitchell ANGB, MilwauANG	ANG	NOV 93	DEC 93	NOV 93	DEC 93
5 r	Gen B. Mitchell FLD, WI	AFR	NOV 93	DEC 93	NOV 93	DEC 93
45	Truax Fld, Madison, WI	ANG	NOV 93	DEC 93	NOV 93	DEC 93
46	Greater Peoria APT, PeoriANG	ANG	DEC 93	JAN 94	DEC 93	JAN 94
47	Capital MAP, Springfield,ANG	ANG	DEC 93	JAN 94	DEC 93	JAN 94
48	Lambert/St. Louis IAP, BrANG	ANG	DEC 93	JAN 94	DEC 93	JAN 94
49	Gulfport/Biloxi RAP, GulfANG	ANG	DEC 93	JAN 94	DEC 93	JAN 94
50	USNAS New Orleans, LA	ANG	JAN 94	FEB 94	JAN 94	FEB 94
6 r	NAS New Orleans, LA	AFR	JAN 94	FEB 94	JAN 94	FEB 94
51	Ellington ANGB, Houston, ANG	ANG	JAN 94	FEB 94	JAN 94	FEB 94
52	Kelly AFB, TX	ANG	JAN 94	FEB 94	JAN 94	FEB 94
53	Hensley FLD, Dallas, TX	ANG	FEB 94	MAR 94	FEB 94	MAR 94
54	Allen C. Thompson Fld, JaANG	ANG	FEB 94	MAR 94	FEB 94	MAR 94
55	Key Field, Meridian, MS	ANG	FEB 94	MAR 94	FEB 94	MAR 94
56	Memphis IAP, TN	ANG	FEB 94	MAR 94	FEB 94	MAR 94
57	Little Rock AFB, AR	ANG	MAR 94	APR 94	MAR 94	APR 94
58	Ebbing ANGB, Ft Smith MAPANG	ANG	MAR 94	APR 94	MAR 94	APR 94
59	Tulsa IAP, OK	ANG	MAR 94	APR 94	MAR 94	APR 94
60	Will Rogers FLD WAPT, OklANG	ANG	MAR 94	APR 94	MAR 94	APR 94
61	McConnell AFB, KS	ANG	MAR 94	APR 94	MAR 94	APR 94
62	Forbes Fld, Topeka, KS	ANG	MAR 94	APR 94	MAR 94	APR 94
63	Rosecrans MAP, St Joesph,ANG	ANG	APR 94	MAY 94	APR 94	MAY 94
7 r	Richards-Gebaur AFB, MO	AFR	APR 94	MAY 94	APR 94	MAY 94
64	Lincoln MAP, Lincoln, NE	ANG	APR 94	MAY 94	APR 94	MAY 94
65	Joe Floss FLD, Sioux FallANG	ANG	MAY 94	JUN 94	MAY 94	JUN 94
66	Sioux City ANGB, SergeantANG	ANG	MAY 94	JUN 94	MAY 94	JUN 94
67	Hector FLD, Fargo, ND	ANG	MAY 94	JUN 94	MAY 94	JUN 94
68	Minn-St Paul IAP, MN	ANG	MAY 94	JUN 94	MAY 94	JUN 94
8 r	Minn-St. Paul IAP, MN	AFR	MAY 94	JUN 94	MAY 94	JUN 94
69	Des Moines MAP, Des MoineANG	ANG	MAY 94	JUN 94	MAY 94	JUN 94
9 r	Youngstown MAP, OH	AFR	JUN 94	JUL 94	JUN 94	JUL 94
70	Niagara Falls IAP, NY	ANG	JUN 94	JUL 94	JUN 94	JUL 94

TABLE A-1, Installation / Equipment Schedule, Cont....

SEQ	BASE	MAJCOM	INCREMENT I		INCREMENT II	
			EQ.DEL.	INSTALL/ROD	EQ.DEL.	INSTALL/ROD
13. ANG/RES Continued.....						
10 r	Niagara Falls IAP, NY	AFR	JUN 94	JUL 94	JUN 94	JUL 94
71	Greater Pittsburgh IAP, PANG		JUL 94	AUG 94	JUL 94	AUG 94
11 r	Greater Pittsburgh IAP, PAFR		JUL 94	AUG 94	JUL 94	AUG 94
72	Yeager APT, Charleston, WANG		JUL 94	AUG 94	JUL 94	AUG 94
73	Kirtland AFB, NM	ANG	JUL 94	AUG 94	JUL 94	AUG 94
74	Tucson IAP, Tucson, AZ	ANG	AUG 94	SEP 94	AUG 94	SEP 94
75	Sky Harbor IAP, Phoenix, ANG		AUG 94	SEP 94	AUG 94	SEP 94
76	March AFB, CA	ANG	AUG 94	SEP 94	AUG 94	SEP 94
77	Van Nuys APT, Van Nuys, CANG		AUG 94	SEP 94	AUG 94	SEP 94
78	Fresno ANGB, CA	ANG	AUG 94	SEP 94	AUG 94	SEP 94
79	NAS Moffett Fld, CA	ANG	AUG 94	SEP 94	AUG 94	SEP 94
80	Reno Cannon IAP, Reno, NVANG		SEP 94	OCT 94	SEP 94	OCT 94
81	Kingsley Fld, OR	ANG	SEP 94	OCT 94	SEP 94	OCT 94
82	Buckley ANGB, Aurora, CO	ANG	SEP 94	OCT 94	SEP 94	OCT 94
83	Cheyenne MAP, Cheyenne, WANG		OCT 94	NOV 94	OCT 94	NOV 94
84	Utah ANGB, Salt Lake City	ANG	OCT 94	NOV 94	OCT 94	NOV 94
85	Great Falls IAP, MT	ANG	OCT 94	NOV 94	OCT 94	NOV 94
86	Fairchild AFB, WA	ANG	OCT 94	NOV 94	OCT 94	NOV 94
87	Portland IAP, OR	ANG	OCT 94	NOV 94	OCT 94	NOV 94
88	Gowen Fld, Boise, ID	ANG	NOV 94	DEC 94	NOV 94	DEC 94
89	Kulis ANGB, AK	ANG	SEP 94	OCT 94	SEP 94	OCT 94
90	Hickam AFB, HI	ANG	SEP 94	OCT 94	SEP 94	OCT 94
91	Anderson AFB, GU	ANG	OCT 94	NOV 94	OCT 94	NOV 94
92	Muniz ANGB, PR	ANG	OCT 94	NOV 94	OCT 94	NOV 94

ANNEX B
CIVIL ENGINEERING SUPPORT REQUIREMENTS
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ANNEX B

CIVIL ENGINEERING SUPPORT REQUIREMENTS

1. Responsibility:

a. The Base Civil Engineer will assign the necessary representatives to the CMOS Site Survey Team. These individuals should have the appropriate expertise to determine specific facility support requirements to meet the criteria in Chapter 5.

b. The PSA requires facility drawings (See Table B-1 of this Annex) that should be available during the site survey. All sketches indicated should be prepared/updated during the site survey and included as a part of the PSA. This ensures that the survey team members concur with all information.

c. The CE Survey Team member will:

(1) Prepare drawings and sketches as required in Table B-1 of this annex.

(2) Ensure that facility support requirements are minimized.

(3) Prepare an initial cost estimate to be submitted with the PSA.

(4) Assist in preparation of documentation (i.e., PSA, AF Form 332, AF Form 1391, etc.) as required by this guide and all applicable regulations

(5) Track preparation of required project/work orders.

(6) Provide final cost estimates and programming documents to the base Comm XP to complete validation and funds transfer requirements. (See below for funding procedures)

(7) Report progress of the facility support to the Base CMOS Manager and Comm XP.

d. After the equipment location and configuration have been confirmed by the Site Survey Team, the facility support requirements can be determined. Support requirements should be only those items essential to the proper operation of the equipment. Existing office space with suitable environmental conditions should be used for equipment installation. Every effort should be made to minimize the support costs.

e. SSC/AQAE (Civil Engineering Division of SSC) will provide a point of contact for questions or problems concerning Civil Engineering actions (AV 446-4940/41).

2. Civil Engineering LAN Support: (See Annex C) The requirement for wall penetrations for LAN cables and interior telephone cable conduits should be included as part of the CE work. Actual location and size of conduits and penetrations will be determined by cable size requirements and as determined by the LAN installation contractor.

3. Drawings. Required drawings are described in Table C-2, Drafting Support. In addition to the items listed in Table C-2, Facility and office drawings must show:

- a. Ceiling and Wall construction.
- b. Obstacles/penetrations.
- c. Building and room dimensions (vertical and horizontal).
- d. Power layout.

e. A sketch of the proposed power distribution shall be included in the PSA. This will ensure that the location and quantity of receptacles are agreed to by the survey team. Existing outlets should be indicated. It should be recognized that a load study of the existing circuits and panels will be necessary to determine the final design. Table 5-3 and Figures 5-5 and 5-6 provide power information to assist Civil Engineers in determining requirements for electrical circuits, panels, and environmental controls.

4. Work Clearance permits. The need for any required permits, clearances, or other paperwork should be identified in the PSA. Copies of these items and requests for specific information should be forwarded to SSC/AQFT with the PSA to prevent delays in system implementation.

5. Work Order Processing.

a. After SSC/AQFT/AQAE have reviewed and approved the site PSA, the site will be notified to begin processing funding requests for construction. The base Comm CMOS representative will prepare an AF Form 332 and/or DD Form 1391, Military Construction Project, as described in AFR 86-1. The appropriate form will then be provided to Comm XP for further processing. Comm XP will forward the construction request for funds to the appropriate Communications Division:

TAC:	HQ TCD/DEMM	PACAF:	HQ PCD/DE
SAC:	HQ SCD/XQE	AFLC:	HQ LCD/DEM

MAC: HQ ACD/DEP AFSC: HQ RCD/DEMM
USAFE: HQ ECD/DEP

b. The Communications Division will approve the construction requirements and send the documents to HQ AFCC/DEP with an information copy to SSC/AQAE, Gunter AFB, AL 36114. SSC/AQAE will validate technical and funding requirements and forward this information to HQ AFCC/DEP for funds transfer.

c. HQ AFCC/DEP/AC will transfer funds to the communications division controller who will then transfer the funds to the base Accounting & Finance Office. Note that funds for CMOS allied support are limited and should not exceed \$15,000 per site. Any exceptions must be previously coordinated and approved by SSC/AQFT/AQAE.

6. Validation/Funding Requirements for Construction. The CMOS program will be centrally funded through HQ AFCC and, as such, will follow the normal funding guidelines. This program will vary from the norm in that the PSA will be prepared at the base level and tracking of the project will be a joint effort between the base LGTT and SCX. Validation that program requirements are met will be accomplished through the CMOS program office in conjunction with the MAJCOM AFCC Division DE. The following are the general procedures for obtaining funds. There are two funding ranges under which CMOS facility support may be accomplished (below \$2,000 and \$2,000 to \$15,000.) Each range has different documentation and procedural requirements as shown below:

a. Projects estimated to require less than \$2,000 should be accomplished under the host/tenant support agreement between AFCC and the base. The following steps are required:

(1) Forward a copy of the completed AF Forms 332 and 327 to SSC/AQFT for tracking purposes.

(2) If, for some reason, the host/tenant agreement does not cover this work, follow the procedure in para b.2 below.

(3) Work required under this category should begin as soon as possible.

b. Projects estimated between \$2,000 and \$15,000.

(1) These projects will require a front-page AF Form 1391 and appropriate planning documentation for validation of the project. DO NOT BEGIN CONSTRUCTION UNTIL YOUR AF FORM 1391 HAS BEEN APPROVED BY YOUR MAJCOM DE AND SSC/AQ. This document must be approved before CMOS funds can be transferred.

(2) The Program Element Code (PEC) for the CMOS Program is PEC 38610.

(3) The BCE will initiate action with the base Facility Board to obtain project approval. The base LGTT and SCX must actively promote and defend their project at the Facility Board in order to obtain the highest priority for approval and accomplishment.

(4) The package should be sent to the base Comm XP after Facility Board approval. They, in turn, will send the package to their AFCC Division DE or equivalent, with copies to HQ SSC/AQFT. The AFCC Division Commander will act on the package after review by the Division DE. SSC/AQFT will work closely with the AFCC Division DE to ensure that all projects are validated and approved in a timely manner.

(5) Funds will be made available only after the project is 100% designed and ready for contract award.

(6) Further information can be obtained through AFCC Pamphlet 700-8, 1 Sep 86; DE File Letters 86-8, 86-14, and 86-18; and AFR 86-1, Civil Engineering Programming, Change 1, 26 Sep 86, Chap 1-5; AFR 700-3, Chap 2, Para 2-11 and Chap 5; and AFR 700-4, Vol 1, Chap 1, Para 1-7v and 1-7w.

The following is a list of maps, drawings, sketches, and required information needed for the PSA. The sketches can be drawn on 8 1/2 x 11 paper free hand as long as the required details are included and they are drawn to scale. Examples of As-built drawings, which can be obtained from BCE, are provided in Annex D, Attachment 5.

[] Base Map

- CMOS Increments I and II facility locations
- Base COMM Switch location
- DDN Concentrator

[] Drawings/sketches

- CMOS I and II Facility Floor Plans (with dimensions)
Show dimensions to include ceiling heights, widths, and lengths of walls and placement of power receptacles, telephone jacks, etc.
- Equipment layout
- Electrical layout
Show power panel locations, main power drop and transformer, and proposed power distribution.
- Air Conditioning requirements
Show A/C locations, diffusers, and tonnage (IF UPGRADE REQUIRED)
- Telephone requirements
Show location of telephone backboard and telephone jacks.
- Proposed radio antenna location

ANNEX C
COMMUNICATIONS SUPPORT REQUIREMENTS
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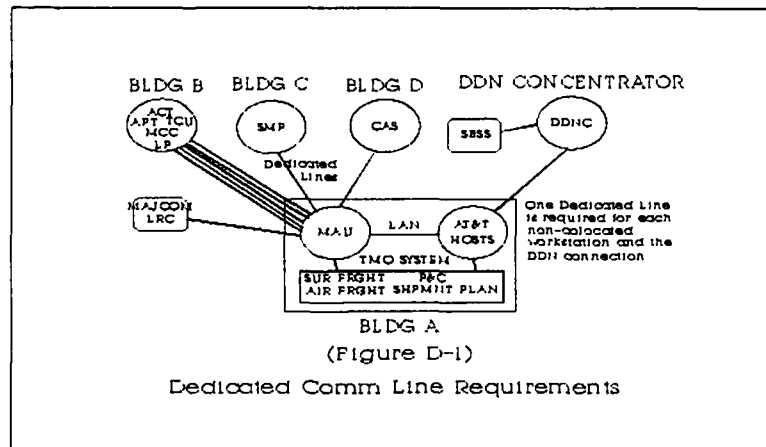
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ANNEX C

COMMUNICATIONS SUPPORT REQUIREMENTS

1. **GENERAL.** The Cargo Movement Operations System (CMOS) requires a robust communication backbone to operate properly. The purpose of this annex is to highlight the communications requirements necessary to support each CMOS functional area and computer system.

2. **WORKCENTER COMMUNICATION REQUIREMENTS.** System communications requirements are as described below and in Figure D-1.



a. CMOS will require a minimum of one four-wire dedicated circuit from the CMOS host location (determined by the base TMO) to the building which houses the Defense Data Network (DDN) Concentrator. The SSC DDN office (AQFC) will provide DDN modems for both ends of the circuit.

b. Any workstation located in the same building as the CMOS host computer (the AT&T 3B2 600 minicomputer from the Multi-user contract) will be directly connected via the LAN installed by our SETA contractor.

c. The minimum telephone line requirements for non-collocated workcenters are: one dedicated four-wire telephone line to each workcenter PC (a two wire connection is an acceptable alternative). If a dedicated line cannot be provided, a dial-up line must be made available. The system is designed to operate at a transmission rate of 9600 baud. If 9600 baud is not attainable, lesser capability can be used. However, it should be noted that a lesser baud rate can have adverse effects on system response time. Dial-up lines may be provided for alternate/contingency mobility workcenter locations. (See Table 5-2 for workcenters.)

d. The office containing the CMOS host computer will require as many four-wire circuits (or alternate dial-up lines) as allo-

cated in para 3.c above. These lines should all terminate in the immediate vicinity of the CMOS host equipment. NOTE: Do not hold up processing Inc I requirements for lack of available lines to support Inc II requirements.

e. An antenna for the base radio station will be required on or near this facility for Inc II. However, requirements for the mounting of this antenna and routing of the cable will be excluded from this site survey since radio requirements are not complete at this time.

f. Local data, system, and hardware security requirements should be verified.

3. AF FORM 3215 REQUIREMENTS. To obtain the circuit support from the base communications unit, the CMOS Program Support Agreement (PSA) must include an AF Form 3215, Communications - Computer Systems Requirements Document (CSRD). Complete the AF Form 3215 in accordance with local base communications regulations. Specific information needed for the AF Form 3215 is provided in Table C-1.

(NOTE: If your base communications unit cannot satisfy the CMOS requirements, notify SSC/AQ/AQFT, Gunter AFB, AL with information copies to MAJCOM LGTT/SCX. This will give the Program Office adequate lead time to work the issue with the Air Staff.

4. DDN REGISTRATION AND CONNECTIVITY: CMOS will use the Defense Data Network (DDN) for long-haul communications. The CMOS DDN host at each base must be registered in the DDN User Requirements Data Base (URDB). This has been completed by the CMOS Program Management Office (PMO) and MAJCOM LGT POCs.

5. Drawings. Drawings of the facility, proposed cable paths, and equipment locations must be provided. (See Annex B) These drawings should identify:

- a. Ceiling and wall construction.
- b. Obstacles/penetrations.
- c. Building and room dimensions (vertical and horizontal).
- d. Power layout.

6. LAN Support. The Local Area Network (LAN) will be installed by a Scientific Engineering Technical Administration (SETA) contractor. The base responsibility will be primarily limited to providing dimensioned cable route drawings, wall penetrations where needed, and electrical and telephone cables to the workcenters. The SETA contractor will prepare an installation plan

which will describe any additional support required from the base. A copy of the installation plan will be provided to the base to assist in LAN support planning.

Table C-1 **INSTRUCTIONS FOR COMPLETING AF FORM 3215**

The following specific information should be included on the Air Force Form 3215, Communications - Computer Systems Requirements

- BLOCK 2. SUBJECT/PROJECT TITLE** Cargo Movement Operations System (CMOS).
- BLOCK 4. PRIORITY** This should be marked ROUTINE; however, based on local communication workload, it could be marked URGENT.
- BLOCK 5. ROD/POD** You should use a 'POD' date. However, based upon workload use an 'ROD' date as determined from Annex A and Tables 3-1 and 3-2.
- BLOCK 6. PROCESS CLASSIFIED** Check 'No'
- BLOCK 7. SENSITIVE UNCLASSIFIED** Check 'Yes'
- BLOCK 9. REQUIREMENT** The Comm requirements as determined by the site survey.
- BLOCK 10. JUSTIFICATION** Fulfillment of functional requirements outlined in PMD no. 5272(2)/38610F. CMOS's AF precedence rating is 2-06 (FAD II). CMOS will automate base-level traffic management. It is a war and peacetime system which will provide real-time cargo movement visibility and improve force deployment.
- BLOCK 11. IMPACT IF DISAPPROVED** CMOS won't function according to the direction of PMD number 5272(2)/38610F. Delays will have schedule and cost impact.

ANNEX D

GENERIC PROGRAM SUPPORT AGREEMENT

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ANNEX D

GENERIC PROGRAM SUPPORT AGREEMENT

1. INTRODUCTION: The purpose of this generic PSA is to provide an example which can be tailored to meet individual base requirements while still providing information needed by the Program Office to complete project actions and engineering. The PSA outlines functional responsibilities and support agreements for equipment requirements and locations, facility preparations, and communication support. When completed, it will outline the agreements of all agencies represented at the site survey and is an official document providing the authority for all tasked agencies to initiate preliminary implementation actions. Except as indicated below, this annex is intended as a guide only and is not a required format. The Comm XP/Survey Team may add any information deemed necessary and alter the format to tailor the PSA to their installation.

2. INSTRUCTIONS:

a. The information in brackets or presented as "*****," should be replaced with specific names, office symbols, or information.

b. Para 2a - 2e. The dates in this paragraph are determined from Annex A and Tables 3-1 and 3-2. Add or subtract appropriate months.

c. The PSA should be signed by the Wing/Base Commander as appropriate. This signature ensures coordination/cooperation by all support agencies on base.

d. PSA Attachment 1, Site Information, para 1. Include the names, office symbols, and phone numbers of all survey team members.

e. PSA Attachment 1, Site Information, para 2. Include the names, office symbols, and phone numbers of all personnel who provided information for the PSA.

f. PSA Attachment 1, Equipment Requirements and Locations. This section shows the standard computer hardware and amount authorized for CMOS. If your site's operational requirements differ from the standard, then enter the new quantities of computer hardware. Where necessary, include explanatory notes on a separate sheet of paper and add to Attachment 1. Examples of differences include:

(a) If one person functions as two workcenters, the second set of equipment should be deleted.

(b) If a workcenter does not exist at your base, then delete its requirements.

(c) If equipment for a workcenter or the central computer area must be dispersed in two or more rooms, it should be indicated.

g. PSA Attachments 2 and 3. Develop a full list by building support required to implement the system. Include appropriate CE workorders and communication requests. Ensure that requirements are shown separately for Inc I and Inc 2.

h. PSA Attachment 4. Provide a set of drawings and sketches for each facility. See the BCE to obtain copies of "As-built" drawings similar to the examples (ceiling plan, power plan, and floor plan) provided. Please provide one copy of these plans with no additional marks except facility updates which are not on the original. If appropriate, you can provide a second copy of the floor plan with equipment placement and any other color codes or identifying marks which will make your document understandable to the engineer who will order the components to install your LAN. Any additional sketches you provide along with the As-built drawings can be 8-1/2" x 11" free hand as long as the required details are included and they are drawn to scale, and contain building and room dimensions. See Annex B, Table C-1 and Chapter 4, Figure 4-1 for specific requirements.

PROGRAM SUPPORT AGREEMENT LETTER

FROM: (WING COMMANDER)

SUBJECT: **Program Support Agreement for ***** AFB, **
Cargo Movement Operations System (CMOS)**

TO: HQ ***** (MAJCOM)/LGT/SCXP
SSC/AQFT

1. Program Information:

a. This Program Support Agreement (PSA) documents the plans and responsibilities for the preparation of specific facilities to receive CMOS equipment at ***** AFB. (Atch 1 provides equipment requirements, configuration, and location.)

b. The purpose of this PSA is to outline functional responsibilities for site preparation and placement of equipment. This PSA outlines agreements of all agencies represented at the site survey and is an official document providing the authority for all tasked agencies to initiate preliminary implementation actions. The CMOS program will support regular and crisis base-level cargo processing, documentation, movement, and tracking. This is a downward-directed requirement with an Air Force precedence rating of 2-6 (FADD II).

c. Authority for the site survey is HQ USAF Program Management Directive (PMD) 5272(2)138610F, dated 21 Jun 1988.

2. Implementation Schedule Dates: (Refer to Tables 3-1 and 3-2 for this paragraph.)

- a. Inc I CE Support Completion: (Installation -2 months)
- b. Inc I Comm Support Completion: (Installation -2 months)
- c. Inc II CE Support Completion: (Installation -2 months)
- d. Inc II Comm Support Completion: (Installation -2 months)

(Note: Please ensure that Inc I and Inc II allied support requirements are addressed separately in the PSA.)

3. Site Information. Attachment 1 lists the names of representatives involved in the CMOS site survey, other points of contact, site hardware requirements, and installation locations.

4. Civil Engineering Support Requirements: Attachment 2 identifies facility preparation requirements.

5. Communication Support Requirements: Attachment 3 identifies communication support for interconnection of remote facilities to the CMOS Local Area Network (LAN). Note: The CMOS installation contractor will be responsible for hardware and cable installation.

6. Drawing and Reference Documents: Attachment 4 contains base, facility, and layout drawings to supplement the preceding attachments.

7. The Comm XP office will be responsible to track, coordinate, and report on progress. However, LGT will remain the primary POC at base level.

8. Funding: The required facility modifications will be funded by the Program Management Office.

XXXX XXXXX, Col, USAF
Commander

- 6 Atch
1. Site Information
2. Base Civil Engineering Support
3. Base Communications Support
4. Drawing List with Drawings

Distribution:	Copies
-----	-----
HQ *****/LGT	1
HQ *****/SCXP	1
SSC/AQFT	2 (Original + 1)
SSC/AQAE	2

CMOS PSA ATTACHMENT 1

SITE INFORMATION

PART 1 - SITE SURVEY REPRESENTATIVES

1. The information for this PSA was obtained during a site survey conducted from ***** to ***** by the following personnel:

NAME	ORGANIZATION	AUTOVON
CMOS PMO Representative(s)	(Lead bases and OT&E bases only)	
MAJCOM Representative	(As determined by MAJCOM)	
Host Base LGT Rep.		
Host Base LGX Rep.		
Host Base SC/XP Rep.		
Host Base CE Rep.		

2. Site information contained herein was obtained from and coordinated with the following individuals:

NAME	ORGANIZATION	AUTOVON
*****	*****	*****
*****	*****	*****

CMOS PSA ATTACHMENT 1

PART 2 - EQUIPMENT REQUIREMENTS AND LOCATIONS

CMOS CENTRAL COMPUTER EQUIPMENT	
AT&T 3B2 Units	2 ea
Lan Cable 10Base5	1 ea
DDN Modems	2 ea
Modems for Modem Rack	8 ea
Modem Rack	1 ea
Lan Terminal Server	1 ea
Line Printer, Medium Speed	1 ea
CADS (Removable Hard Disk Drives)	2 ea

Enter amount of required equipment (if different from numbers shown):

CMOS WORKCENTER SYSTEM EQUIPMENT								
Hardware: Section	Workstation 80386	Dot Mat Printer	Laser Printer	Modem	HHT	Bldg #	Room #	Notes #
I N C R E M E N T I	System Manager	1	1					
	Air Freight	1	1		1	1		
	Surface Freight	1	1	1		1		
	Shipment Planning	1	1					
	Packing & Crating	1	1	1		1		
	Air Clearance Auth	1	1		1			
	Mob Control Center	1	1		1			
I N C R E M E N T I	Transp Ctrl Center	1	1		1	1		
	Air Cargo Terminal	1	1	1	1	2		
	Air Pas Terminal	1	1		1			
	Sub-Motor Pool	1	1		1			
	Load Planning	1	1	1	1			
II	MAJCOM LRC	1	1		1			
	Combat Ammun Sys	1	1		1			
	LGTX (Tempest)	1	1					

CMOS PSA Attachment 2

BASE CIVIL ENGINEERING SUPPORT

INCREMENT I REQUIREMENTS:

1. Facility Requirements:

a. TMO Functional Areas:

(List requirements and explanation)

INCREMENT II REQUIREMENTS:

2. Facility Requirements:

a. Mobility Areas:

(List requirements and explanation)

Base Civil Engineer Squadron Commander Signature

CMOS PSA ATTACHMENT 3

BASE COMMUNICATIONS SUPPORT

INCREMENT I REQUIREMENTS:

1. Host Base/Wing XP will:

- a. (Provide explanation of comm support including dedicated and dial-up lines. List each specific requirement.)
- b. Include location of DDN Concentrator (or future location if not installed).

INCREMENT II REQUIREMENTS:

Comm Squadron Commander Signature

CMOS PSA ATTACHMENT 4

DRAWING LIST WITH DRAWINGS

(NOTE: See Table B-2 for list of required drawings.)

1. Base Map.
2. Affected Buildings.
 - a. Bldg *** (Main CMOS functional area).
 - (1) Floor Plan.
 - (2) Ceiling Plan.
 - (3) Power.
3. Equipment drawings showing location of office functions and desired location of CMOS hardware.